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HYDROLOGIC STUDIES

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COMPILATION OF RAINFALL AND RUN-OFF FROM THE WATERSHEDS AND TERRACED AREAS OF THE FORT HAYS CONSERVATION EXPERIMENT STATION HAYS, KANSAS

1930-38

Office of Research
SCS-TP-37
August 1940

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
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HYDROLOGIC STUDIES

COMPILATION OF RAINFALL AND RUN-OFF FROM WATERSHEDS AND TERRACED AREAS OF THE FORT HAYS, KANSAS CONSERVATION EXPERIMENT STATION HAYS, KANSAS

1930-1938

by

Raymond R. Drake, Associate Agricultural Engineer
Formerly in Charge Hays, Kansas
and
S. A. Michael, Junior Hydraulic Engineer
R. O. Baum, Junior Hydraulic Engineer
Hastings, Nebraska

Prepared under the direction of
C. E. Ramser, Chief, Hydrologic Division

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(4462)

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1	Map of the conservation experiment station
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4	Map of watershed 6-L
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COMPILATION OF HYDROLOGIC DATA ON SMALL WATERSHEDS ON THE HAYS, KANSAS EXPERIMENT STATION

I. The Experiment Station History

The station was established in March 1901 and made a branch of the Kansas Experiment Station. The land set aside for the Hays Station was almost one-half of the old Fort Hays Military Reservation and embraces a total area of approximately three thousand six hundred acres. About half of this land is actually under cultivation. Figure 1 shows a general layout of the station.

During the first few years all experimental work was carried on without assistance from the Federal Government. Since 1906, several Federal projects have been established, including the Bureau of Plant Industry, Office of Dry Land Agriculture in 1906, Office of Cereal Crops and Diseases in 1912, Office of Forage Crops and Diseases in 1913, and the Soil Erosion and Water Conservation Investigations project, consisting of the Bureau of Agricultural Engineering and the Bureau of Chemistry and Soils in 1929. In 1935 the Soil Erosion and Water Conservation Investigations project was included as a part of the Soil Conservation Service under the Department of Agriculture and was operated in this capacity until the end of the calendar year of 1938.

The station is in a representative section of the Central Great Plains where dry farming is necessary and winter wheat is

the principal cultivated crop. Central Western Kansas, the Northern portion of extreme Western Oklahoma, extreme Eastern portion of Colorado and the South Central and South West portion of Nebraska adjacent to the State of Kansas may be considered represented by the Hays, Kansas station.

Raymond R. Drake was in charge of the Engineering Investigations from 1929 to 1935, inclusive, and F. G. Ackerman was in charge from 1936 to 1938, inclusive.

Acknowledgment.

Acknowledgment is made to the U. S. Weather Bureau for precipitation and temperature data, the Bureau of Plant Industry, Office of Dry Land Agriculture, Hays, Kansas, for evaporation and wind data, and to those men in charge of the investigations 1929 to 1938, inclusive, and to C. E. Van Doren for their work in collecting the other basic records. Mr. Ackerman also aided in supplying the necessary information prior to final compilation of data of this report. W. D. Potter and L. L. Harrold of the Washington office, Hydrologic Division, prepared the instructions for compiling the data. Mr. Harrold initiated the compilation work in the field and reviewed the compilation before publication.

Physical Characteristics of the Station.

The Soil Erosion and Water Conservation Investigations project is a part of the Fort Hays Experiment Station, located in Ellis County, Kansas, about two miles southeast of Hays. It is

about seventy-five miles south of the Kansas-Nebraska line, 160 miles east of the Kansas-Colorado line and 125 miles north of the Kansas-Oklahoma line. The latitude is approximately 38° 52' north, and the longitude is approximately 99° 25' west. The elevation is about 2000 feet above mean sea level.

The topography of the project varies from level to rolling. The steeper slopes are from 8 to 10 percent. General drainage is good.

The native sod was broken about 1906. The soil is easily tilled unless it is very wet or dry. Under conditions of normal rainfall and proper management a mellow, ideal seed bed can be easily prepared. The average soil has an abundance of plant food so that rainfall and water conservation are the chief limiting factors in crop production. When the soil becomes extremely dry from lack of rainfall or when it produces a heavy crop, it may check and crack. Later when rain occurs some of the water enters the subsoil through these fissures. The soil is predominantly Colby silty clay loam and is subject to severe wind erosion on the flatter slopes and to water erosion on the steeper slopes. Wind erosion had been severe before the establishment of the project in 1929.

Precipitation.

The distribution of precipitation and the time of its occurrence are the chief limiting factors in crop growth and from an

agricultural standpoint usually receives more attention than all other phases of the weather. The precipitation is often irregular in quantity and in seasonal distribution. It may be in the form of local showers or it may be of a general nature and cover a very large area. Torrential rains usually occur every year in the region and at times are the cause of considerable damage by floods and soil erosion.

The total annual precipitation has varied from a low of 11.8" in 1894, to a high of 35.40" in 1878. The average annual rainfall for the 63-year period, 1868 to 1930, inclusive, is 22.91".

The average rainfall for the months of the growing season, April 1 to September 30, is approximately three-fourths of the annual or about 17.2 inches.

Snowfall.

The annual snowfall in the Hays section varies from about 10" to 24". As a rule the ground is not covered with snow for a very long period. The snow frequently drifts badly in the roads and around buildings leaving the fields bare. A deep snow that lies on the ground for a long time is favorable for wheat.

Temperatures.

The summers are usually hot and dry. High winds in February and March often cause considerable soil blowing and sometimes considerable damage to wheat. The winters are usually comparatively mild, although occasionally the temperature suddenly drops as much as 60 degrees in 24 hours. The average first killing frost occurs

about April 30 and the last killing frost occurs about October 12, or the average frost free period is about 165 days per year.

Evaporation.

The average monthly evaporation from a free water surface during the growing season for the 33 years period, 1907 to 1939, inclusive, is as follows: April 5.85", May 6.84", June 8.50", July 10.57", August 9.61" and September 7.48".

Wind.

The average monthly wind velocity, approximately 2 feet above the ground surface, during the growing season for the 33-year period, 1907 to 1939, inclusive, is as follows: April 10.35, May 8.79, June 7.72, July 7.01, August 6.76 and September 7.73 miles per hour.

Description and History of Each Watershed.

The seven small watersheds and terraced areas (only part of the work conducted at this project) are considered in this report. These seven watersheds and terraced areas, for which data are compiled herein, were established to determine the effect of land-use and tillage operations on crop yields, surface runoff and soil loss. After installation of these plots, there were no changes made in either the boundaries or type of conservation practice. The land-use for each watershed is shown in table 1. The physical characteristics of the watersheds and terraces are given in table 2.

TABLE 1. Land use

Watershed No.	Acres	1930	1931	1932	1933	1934	1935	1936	1937	1938
2-L	1.03	Barley	Wheat	Corn	Barley	Wheat	Kafir	Barley	Wheat	Kafir
3-L	.85	do	Barley	Wheat	Corn	Barley	Wheat	Kafir	Barley	Wheat
4-L	.87	do	Corn	Barley	Wheat	Corn	Barley	Wheat	Kafir	Barley
2-N	2.81	do	Fallow	Wheat	do	Wheat	Wheat	do	Wheat	Wheat
3-N	2.95	do	do	do	do	do	do	do	do	do
6-L	2.85	do	Wheat	do	do	do	do	do	do	do
1.61 AG	1.61	Pasture	Pasture	Pasture	Pasture	Pasture	Pasture	Pasture	Pasture	Pasture

Table 2. Summary of physical characteristics of the watersheds and terraces

Watershed or terrace No.	1 Terrace length	2 Terrace grade per 100 feet	3 Vertical spacing of terrace	4 Average width of terraced area	5 Land slope	6 Percent of area in Colby Silty Clay Loam
	Feet	Inches	Feet	Feet	Percent	Percent
2-L	700	4	4	64	5 to 6	100
3-L	do	do	do	53	5 to 7	do
4-L	do	do	do	54	6 to 8	do
2-N	1600	Level	2	76	3 to 7	90
3-N	do	do	3	80	do	do
6-L	Cultivated unterraced watershed				4 to 7	100
1.61 AG	Native pasture watershed				5 to 8	85

Terrace Plot 2-L, shown in figure 2 and on plate I, was established in 1930. The land slope ranges from 5 to 6 percent. The soil is Colby silty clay loam. From 4 to 10 inches of topsoil had eroded prior to 1930.

The terrace was constructed from the upper side in March 1930 as a broad base Mangum terrace. The terrace specifications were a 25' width of disturbed soil, ridge height of 1.4 to 1.5 ft., length of 700 ft., vertical spacing of 4 ft., and a constant channel grade of 4 in. fall per 100 ft. of terrace length. Eight years after construction the width of terrace is practically the same although the height had been reduced from 1.4 to .9 ft.

All farming operations were performed parallel to terrace, thus practically maintaining the original height and developing a better terrace cross section.

The crop rotation prior to 1935 was wheat, corn and barley. Kafir sorghum was then substituted for corn and remained in the rotation until the close of the experiment.

Terrace plot 3-L, shown in figure 2 and on plate I was established in 1930. The land slope ranges from 5 to 7 percent. The soil is Colby silty clay loam. From 3 to 8 inches of topsoil had eroded prior to 1930. The terrace was constructed from the upper side in March 1930 as a broad base Mangum terrace. The terrace specifications were 25 ft. width of disturbed soil, ridge height of 1.4 to 1.5 ft., length of 700 ft., vertical spacing of

4 ft. and a constant channel grade 4 in. per 100 ft. of terrace length. Eight years after construction the width of terrace is practically the same, although the height had been reduced from about 1.4 to 0.7 ft.

All farming operations were performed parallel to terrace, thus maintaining the terrace not to the original height but developing a better cross section. The crop rotation for this area prior to 1936 was wheat, corn and barley. Kafir sorghum was then substituted for corn and remained in the rotation until the end of the experiment.

Terrace plot 4-L, shown in figure 2 and on plate I, was established in 1930. The land slope ranges from 6 to 8 percent. The soil is Colby silty clay loam. From 3 to 6 inches of topsoil had eroded prior to 1930.

The terrace was constructed from the upper side in March 1930, as a broad base Mangum terrace. The terrace specifications were a 25 ft. width of disturbed soil, ridge height of 1.4 to 1.5 ft., length of 700 ft., vertical spacing of 4 ft., and a constant channel grade of 4 in. per 100 ft. of terrace length. Eight years after construction the width of the terrace is practically the same although the height had been reduced from approximately 1.5 to 0.6 ft.

All farming operations were performed parallel to the terrace, thus maintaining the original width, developing a better cross section but not maintaining the original height.

The crop rotation for this area prior to 1937 was wheat, corn and barley. Kafir sorghum was the substitute for corn and remained in rotation until the close of spring.

Terrace plot 2-N, shown in figure 3, was established in 1931. The land slope is from 3 to 7 percent. Colby silty clay loam comprises 90 percent of the soil. Erosion had removed from 3 to 6 percent of topsoil prior to 1930.

The terrace was constructed from each side in March 1931 as a broad base Mangum terrace. The specifications were 25 ft. width of disturbed soil, ridge height of 1.5 ft., length of 1600 ft., vertical spacing of 2 ft., and a constant level channel for its entire length. Seven years after construction the width of the terrace ridge had increased, and the height had been reduced from 1.5 ft. to 1. ft.

All farming operations were performed parallel to terrace, thus maintaining and increasing the width, and the result was a much better cross section. The crop rotation for this area consists of continuous wheat. Wheat continued until the close of the

experiment.

Terrace plot 3-N, shown in figure 3, was established in 1931. The land slope is from 3 to 7 percent. Colby silty clay loam comprises 90 percent of the soil. Erosion had removed from 1 to 6 inches of topsoil prior to 1930.

The terrace was constructed from each side in March 1931 as a broad base Mangum terrace. The terrace specifications were a 25 ft. width of disturbed soil, ridge height of 1.5 ft., length of 1600 ft., vertical spacing of 3 ft. and a level channel for its entire length. Seven years after construction the width of the terrace ridge had increased and the height had been reduced from 1.5 ft. to 1 ft.

The farming operations were performed parallel to the terrace, thus maintaining and increasing the width, and the result is a much better cross section. The crop rotation for this area consists of continuous wheat.

Watershed 6-L, shown in figure 4, and on plates I and II, was established in 1934. The land slope ranges from 4 to 7 percent. The soil is Colby silty clay loam. Erosion had removed 8 to 9 inches of topsoil prior to 1930. Watershed 6-L is an unterraced area of 2.85 acres and was cropped continuously to wheat throughout the experiment.

Watershed 1.61 AG, shown in figure 5 and on plate III, was established in 1932. The land slope ranges from 5 to 8 percent. Colby silty clay loam comprises 85 percent of the soil. There is

no evidence of erosion. The watershed cover consists of native buffalo and gramma grass. The area has always had controlled grazing.

Instrumentation.

Rain gages. The recording rain gage 2-L (see figures 1 and 2 for location) is a Fergusson weighing and recording gage. The charts have a vertical scale of 1-1/2 inches equal 1 inch of rainfall and a horizontal scale of 1 inch equals 125 minutes (24 hour chart) for the year 1931 and 1 inch equals 62.5 minutes (12 hour chart) for 1932 to 1938, inclusive. The standard gages 3-N and USWB are of the standard U. S. Weather Bureau type.

Water Level Recorders. Bristol recorders were used on all installations for recording the height and time runoff was flowing through the flumes. The recorder charts have a vertical scale of 2.7 inches equal to 1 foot gage height, and a minimum horizontal scale of 80 minutes per inch of chart and a maximum horizontal scale of 22 minutes per 1 inch of chart. The recorder uses a circular chart of 360 degrees making one revolution every 12 hours.

Parshall Flumes. The Parshall flumes were used to measure the runoff water. These flumes were constructed of heavy sheet metal as shown on plates IV and V. A 6 inch flume was used to measure the runoff from the pasture area 1.61 AC. A 1 ft. flume was used on each of the 2-L, 3-L, 4-L, 2-N and 3-N terraced areas and a 2 ft. flume was used on the 6-L cultivated unterraced watershed.

Silt Box. A silt box was installed downstream and adjacent to the

Table 3. Watershed Instrumentation

Watershed No.	FLUMES[o] Type and size	WATERSTAGE Make	RECORDER[oo] Scales: Smallest Division equals Time (Minutes)	Gage Height (Feet)	Date of Installation
2-L	Parshall 1 foot	Bristol	5	.02	1930
3-L	do	do	do	do	do
4-L	do	do	do	do	do
2-M	do	do	do	do	1931
3-M	do	do	do	do	do
6-L	Parshall 2 feet	do	do	do	1934
1.61 AG	Parshall 6 inches	do	do	do	1932

[o] All flumes constructed of sheet metal.

[oo] All waterstage recorders have a 2.9 gage height ratio.

Parshall flume. As the size of the flume increased, the silt box was increased so that the bed load could be handled and the Ramser silt sampler attached to the silt box would operate satisfactorily.

Flume size	Silt box dimensions
6 inch	3 feet wide, 16 feet long and 1-1/2 feet deep
12 inch	5 feet wide, 16 feet long and 1-1/2 feet deep
2 foot	8 feet wide, 32 feet long and 2 feet deep

Ramser Silt Samplers.

The Ramser silt sampler is placed on the side of the silt box, 2 feet from the end weir, as shown on plates IV and VI. The bottom of the vertical slot entrance to the sampler is installed at the same elevation as the end weir. Thus a sample is obtained of all the runoff that passes over the weir. The sample entering the sampler is then divided by a 3-inch and a 1/2-inch slot, the runoff from the 1/2-inch slot being retained in the tank at the end of the sampler and the runoff from the 3-inch slot being wasted.

Soil Loss Measurements.

Three quart samples are obtained from the total silt sample collected in the silt tank. Those silt samples are dried and the soil loss per unit volume is easily determined. Samples are taken concurrently from the runoff passing into the silt tank and water passing over the large weir to determine the relation between the amount of silt carried in the runoff passing over the weir and that

in the tank. Plate VI shows a sample being taken from the sample splitter.

The bed load material in the silt box is measured volumetrically and several samples taken to determine the total amount of deposited material.

Graph and Tabulation Sheets.

Rainfall. On the tabulation form SCS-345, all storms, regardless of whether or not surface runoff resulted, were tabulated.

The rainfall amount was obtained from measurements taken from rain gages nearest the plots under consideration. The intensities, given in columns 8, 9, and 10 were taken from the charts of the recording rain gage 2-L, as was the information listed in columns 5 and 6. The temperatures were taken from the U. S. Weather Bureau monthly publication of "Climatological Data" for Hays, Kansas.

In plotting the rainfall graphs, rainfall depths at the break points of the recorder trace were tabulated and plotted, and the intensities between these break points calculated and plotted, as shown in curves labeled "Intensity (ins./hr.)".

Surface Runoff.

The gage heights and time were tabulated at break points and other points on the Bristol waterstage charts. The rates were taken from a rating table and plotted in cubic feet per second. Then the accumulated runoff for each time increment was calculated and plotted on the graph sheet labeled as "Accumulated Runoff". The runoff values in the tables were taken from the Bristol charts.



Plate I. View of terraced areas 2-L (left), 3-L (center), 4-L (right), and 6-L, (upper right). (Aug. 15, 1936)



Plate II. View of Watershed 6-L from Lower end showing the two-foot Parshall flume, 8 x 32 ft. concrete and stone silt box. (Sept. 27, 1937)



Plate III. View of pasture plot 1.61 AG, looking west from upper end of the plot. (Oct. 2, 1935)



Plate IV. View of run-off water and silt measuring equipment. (Nov. 9, 1933)



Plate V. Concrete plaster floor and wing walls on inlet side of one Parshall flume. (Feb. 7, 1934)



Plate VI. Taking a sample from run-off water caused by a [illegible] inch rain, June 9, 1932. Terrace 2N.

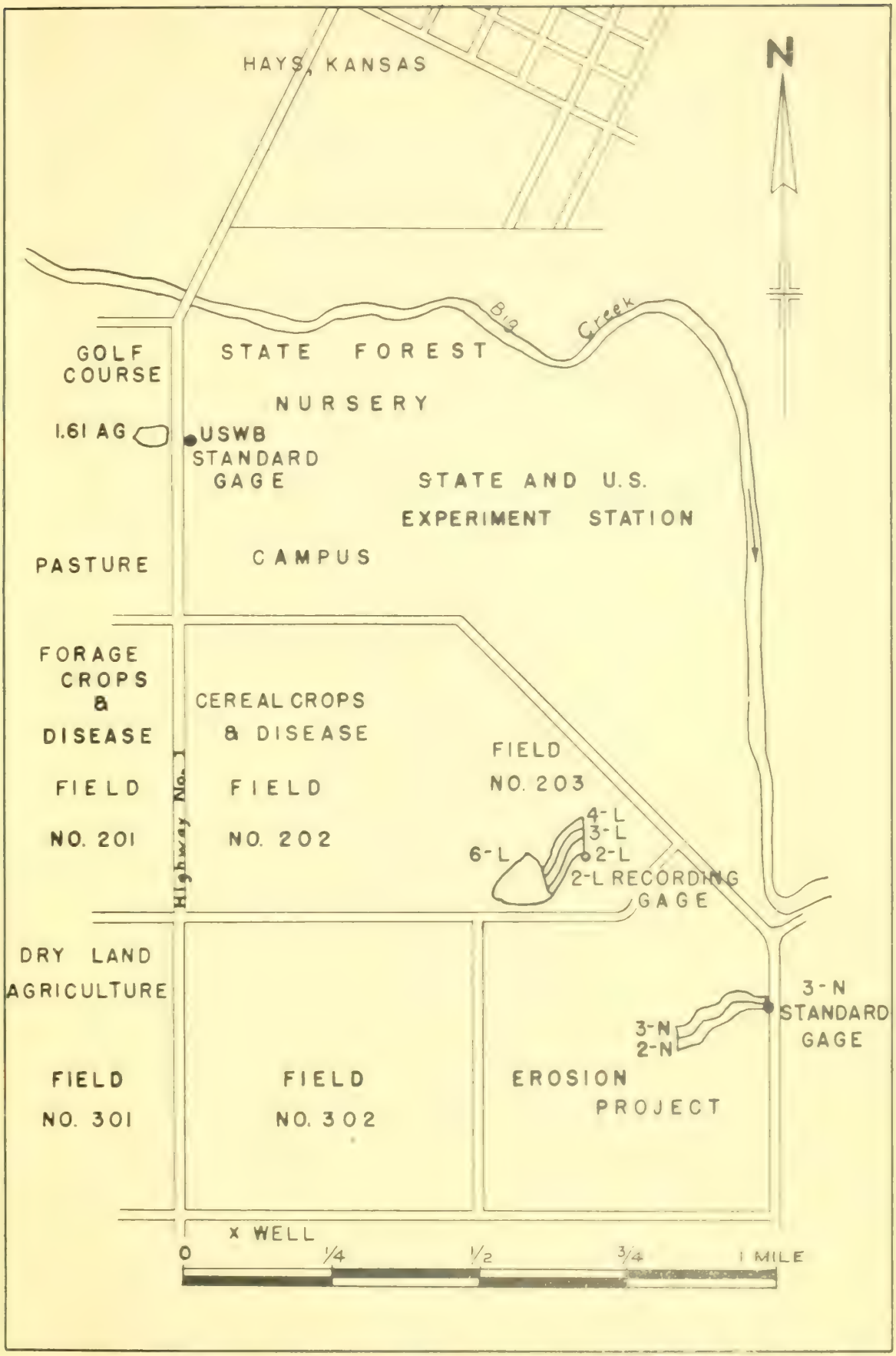


FIGURE 1. LOCATION MAP OF FORT HAYS EXPERIMENT STATION HAYS, KANSAS

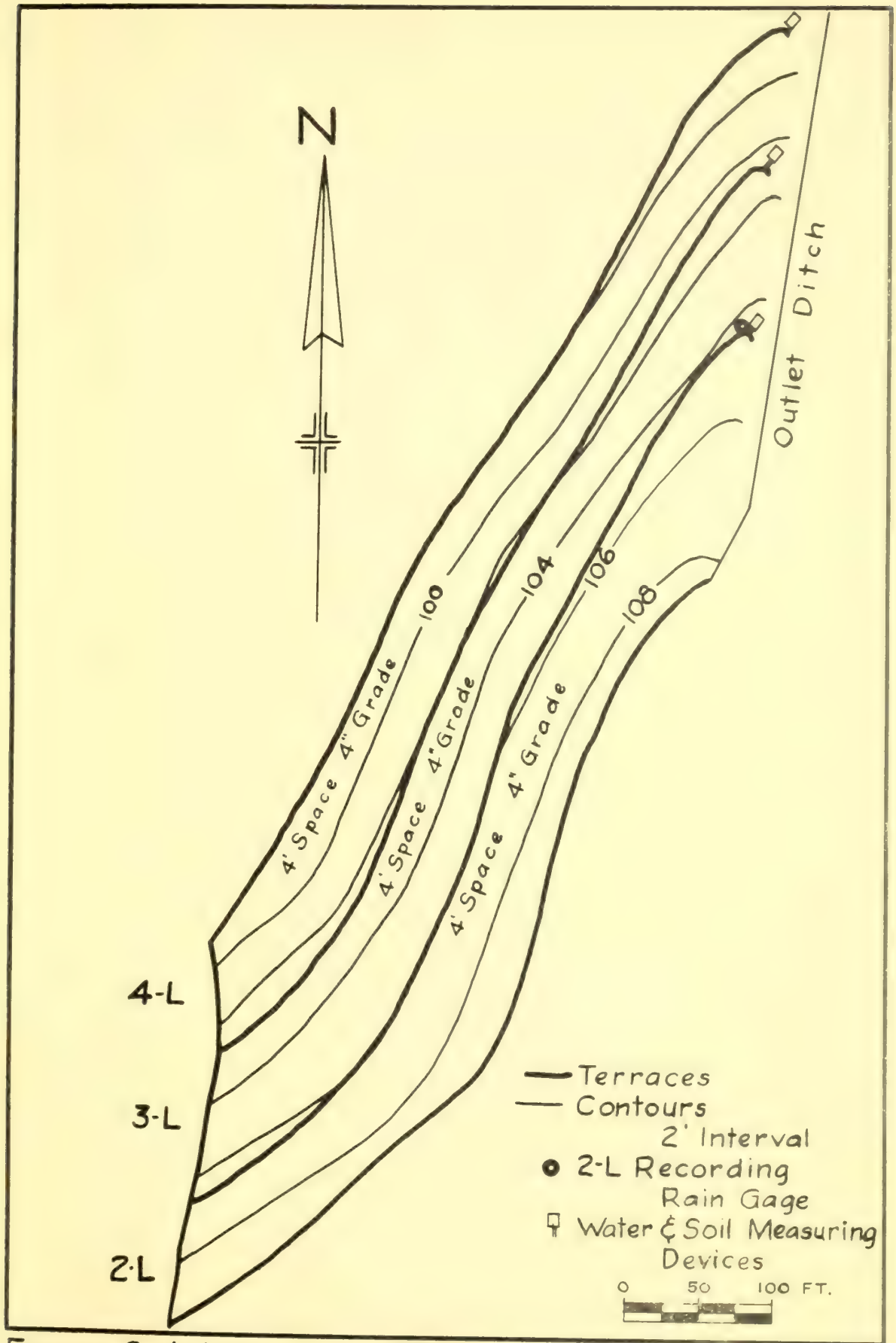


FIGURE 2. WATERSHEDS 2-L, 3-L, & 4-L

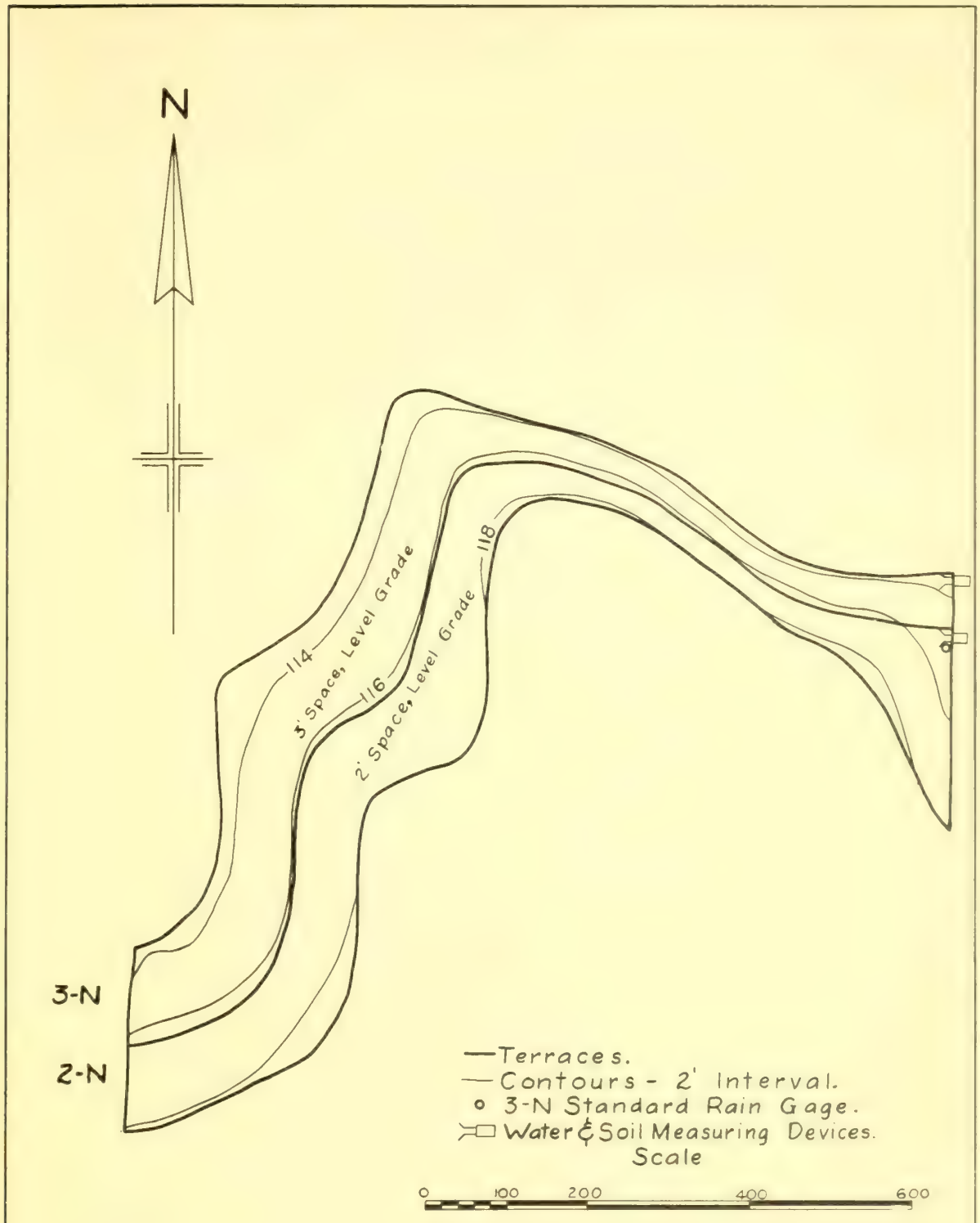


FIGURE 3. WATERSHEDS 2-N & 3-N

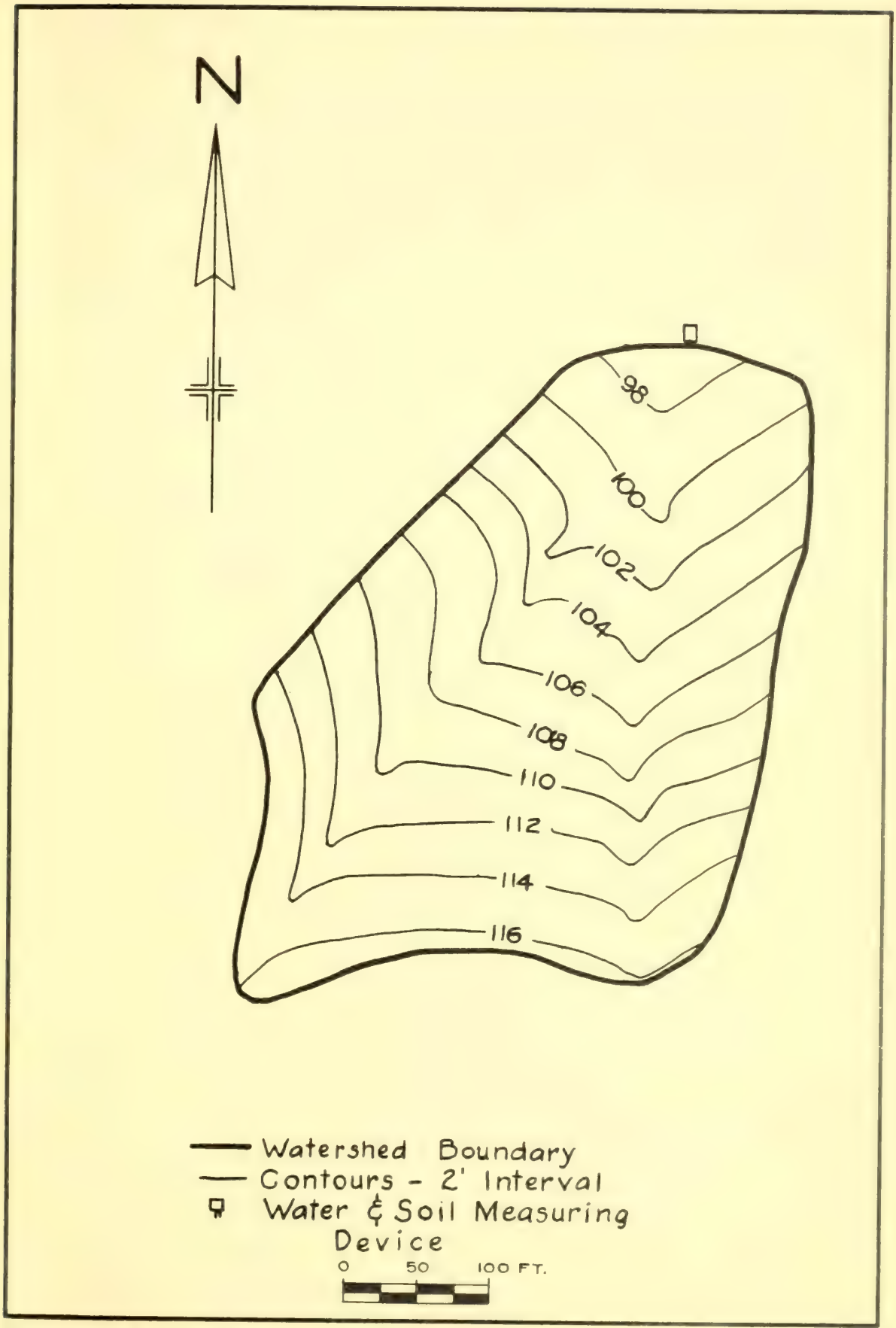


FIGURE 4. WATERSHED 6-L

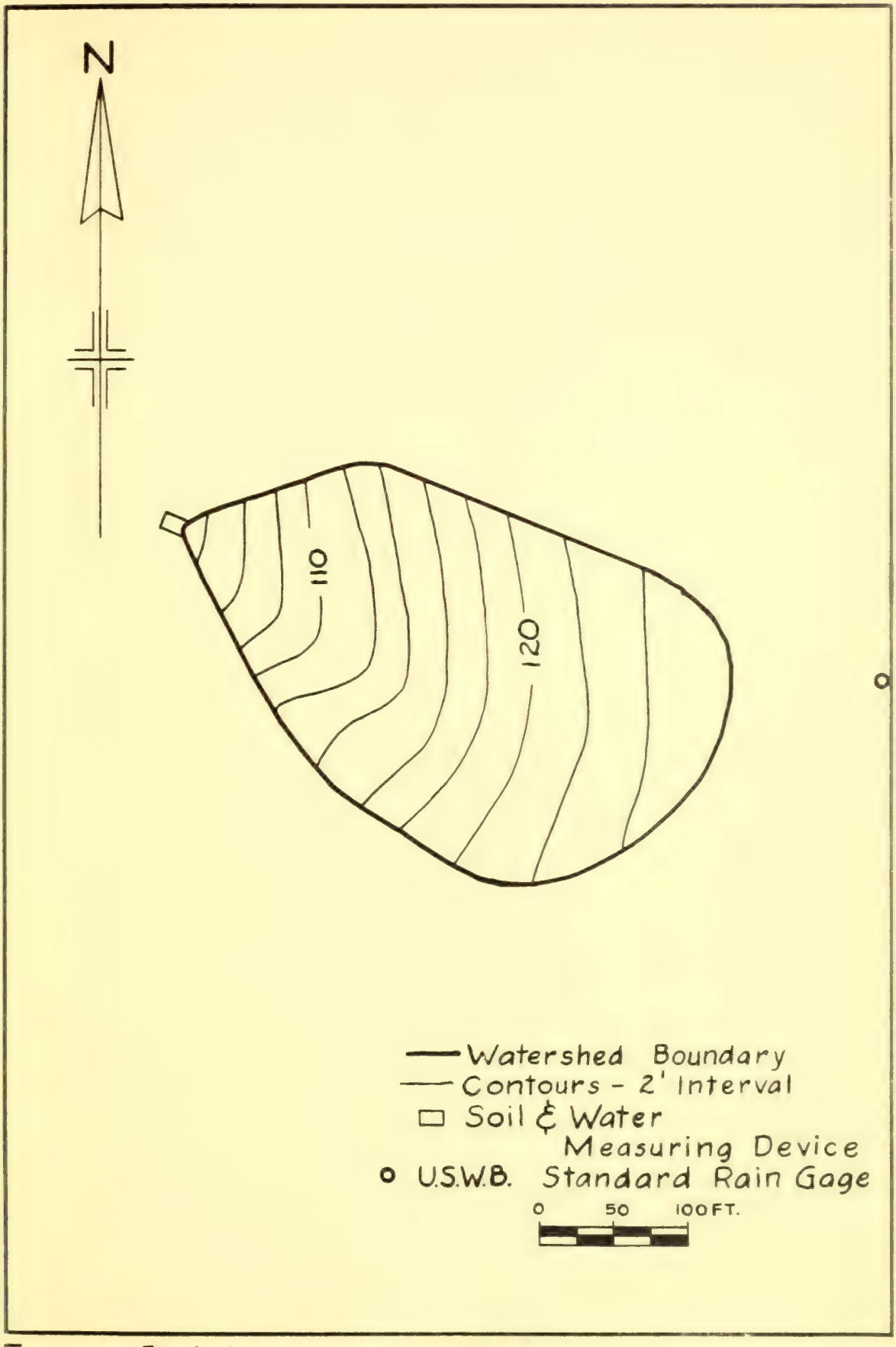


FIGURE 5. WATERSHED 1.61 A G

Form S. C. S.-346

UNITED STATES DEPARTMENT OF AGRICULTURE
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RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH January, February, March, April, 1930

SHEET 1 OF 5 SHEETS

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOAD (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
January 7		U. S. Weather Bureau				.10	Standard Gage			18	2	No Runoff							2-L. Terraced Area. Colby Silt Clay Loam. Average land slope 5 to 6 %. Vertical spacing 4 feet. Grade constant 4 inches. Terraced length. 700 feet. Planted to Barley. 3-14. Barley harvested 6-28. One way plowed 7-14. One way plowed 9-22. Seeded to wheat 9-27.
9		do	do		do	T		do	do	10	-11	do	do						
12		do	do		do	T		do	do	34	6	do	do						
13		do	do		do	.20		do	do	16	10	do	do						
16		do	do		do	T		do	do	3	-13	do	do						3-L. Terraced Area. Colby Silt Clay Loam Average land slope 5 to 7%. Vertical Spacing 4 feet. Grade constant 4 inches. Terrace length 700 feet. Planted to Barley 3-14. Barley harvested 6-28. One way plowed 7-14. One way plowed 9-22. Planted to wheat 9-27.
19		do	do		do	T		do	do	21	10	do	do						
20		do	do		do			do	do	10	-2	do	do						
February 13		do	do		do	.16		do	do	38	30	do	do						
27		do	do		do	T		do	do	58	25	do	do						
28		do	do		do	.47		do	do	48	28	do	do						4-L. Terraced Area. Colby Silt Clay Loam. Average land slope 6 to 8%. Vertical spacing 4 feet. Grade constant 4 inches. Terraced length. 700 feet. Planted to Barley 3-14. Barley harvested. 6-28. One way plowed 7-14. One way plowed 9-22. Planted to wheat 9-27.
March 18			2-L			.03	---	---	---	35	20	do	do						
21		do	do		do	.02		do	do	49	29	do	do						
April 17			2-L			.94				67	35								
(a) 26				4:56P	1094	.79	.36	.28	.22	51	44	No Runoff							
28			2-L	8:55A	43	.07	.12	.08	.08	60	46	No Runoff							

(a) Curve from chemistry and Soils Gage.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month April, May, June, 1930

Project HAYS, KANSAS

Sheet 2 of 5 sheets

Date	Watershed		Rainfall				Maximum Intensity			Temperature (degrees F)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate Cu ft sec	Maximum Rate Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
April 29-30				2:55A	788	.74	.72	.72	.46	78	49	No	Runoff						
30			2-L	11:20P	15	.04	.24	.16		78	49	No	Runoff						
May 3			2-L	4:00P	235	.86	2.76	1.24	.82	77	55	No	Runoff						
6			2-L	8:50P	99	.32	1.08	.48	.48	69	52	No	Runoff						
10			2-L	8:06A	101	.65	2.16	1.92	1.02	66	50	No	Runoff						
12			2-L	7:13P	10	.02	.12	---	---	72	41	No	Runoff						
15			2-L	3:38A	350	.65	.48	.32	.20	58	48	No	Runoff						
16			2-L	1:09A	71	.15	.24	.16	.14	64	47	No	Runoff						
17			2-L			.11		---	---	M	42	No	Runoff						
19			2-L	---	---	.03	---	---	---	75	32	No	Runoff						
June 2			2-L	2:44A	4	.06	---	---	---	84	52	No	Runoff						
4			2-L	1:26A	14	.04	---	---	---	86	63	No	Runoff						
4*	2-L	1.03	2-L	4:30P	486	1.36	2.28	1.72	1.06	86	63	4:46P	5:40P	.069	.16	4:52P	1.29	No Records taken.	
	4-L	.87	2-L	4:30P	486	1.36	2.28	1.72	1.06	86	63	4:46P	5:41	.089	.25	4:47P	1.27		
(a) 9*	2-L	1.03		1:28A	401	1.11	.48	.48	.45	65	55	7:03A	8:03A	.029	.05	7:19A	1.08	No Records taken.	
(a)	4-L	.87		1:28A	401	1.11	.48	.48	.45	65	55	7:11A	8:11A	.036	.04	7:12A	1.07		

* Hydrographs plotted for these storms.
(a) Record taken from Bureau of Chemistry and Soils Recording Gage.

Form S.C.S.-105

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

PROJECT HAYS, KANSAS

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

MONTH June, July, August, 1930

Date	Watershed		Rainfall							Temperature (degrees F.)		Runoff					Rainfall Minus Runoff (inches)	Silt Loss (tons per acre)	Condition of Watershed
							Maximum Intensity								Maximum Rate				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
June 10			2-L	3:51A	23	.12	.36	.32	---	68	54	No Runoff							
14-15*	2-L	1.03	2-L	7:23P	305	.96	3.02	1.79	1.26	87	57	10:40P	12:13A	.139	.20	10:56P	.82	No Records taken.	
	3-L	.85	2-L	7:23P	305	.96	3.02	1.79	1.26	87	57	10:36P	12:36A	.227	.25	10:49P	.73		
	4-L	.87	2-L	7:23P	305	.96	3.02	1.79	1.26	87	57	10:37P	12:50A	.297	.22	10:51P	.66		
19			2-L	7:58A	38	.03	.12	.09	.06	83	63	No Runoff----						No Records taken.	
28(b)			2-L			.17				101	57	No Runoff----							
July 3			2-L	12:31A	99	.08	.12	.08	.08	95	65	No Runoff----							
13			2-L	4:27A	92	.15	.24	.16	.12	96	67	No Runoff----							
20-21			2-L	6:56P	376	.48	1.44	.48	.28	106	69	No Runoff----							
23			2-L	2:31A	172	.36	.48	.24	.20	94	67	No Runoff----							
30-31			2-L	9:45P	158	.11	.12	.08	.06	91	61	No Runoff----							
August 4			2-L	10:31P	44	.04	.12	.08	.06	98	73	No Runoff----							
5			2-L	4:09P	28	.44	1.8	1.8	---	101	71	No Runoff----							
10			2-L	5:40P	40	.25	.20	.12	.08	97	67	No Runoff----							
13			2-L	9:21P	141	.10	.24	.16	.10	96	69	No Runoff----							
17-18			2-L	9:12P	261	.24	.36	.24	.20	90	62	No Runoff----							

* Hydrographs plotted for these storms.
(b) Rain taken from chemistry and Soils Gage.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month August, September, October, 1930

Project HAYS, KANSAS

Date	Watershed Number	Watershed Area (acres)	Rainfall Gage No	Rainfall Began (hour)	Rainfall Duration (minutes)	Rainfall Amount (inches)	Rainfall Maximum Intensity 5 minutes (inches per hour)	Rainfall Maximum Intensity 15 minutes (inches per hour)	Rainfall Maximum Intensity 30 minutes (inches per hour)	Temperature (degrees F) Maximum	Temperature (degrees F) Minimum	Runoff Began (hour)	Runoff Ended (hour)	Runoff Amount (inches)	Runoff Maximum Rate Cu. ft. per sec.	Runoff Maximum Rate Time	Rainfall Minus Runoff (inches)	Silt Loss (tons per acre)	Condition of Watershed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
August 18			2-L	2:54A	134	.25	.36	.28	.20	89	65	No Runoff--							
19*			2-L	9:24P	115	1.16	3.00	2.64	1.37	95	65	9:53P	11:56P	.381	1.28	9:59P	.78		No Records taken.
			3-L	9:34P	115	1.16	3.00	2.64	1.37	95	65	9:50	11:58	.239	.46	9:59	.92		
			4-L	9:34P	115	1.16	3.00	2.64	1.37	95	65	9:49	1:02A	.371	.35	9:56	.79		
24			2-L	2:06A	25	.07	.12	.12	---	82	63	No Runoff--							
25-26(a)			2-L	10:30P	178	.37	.24	.20	.20	90	62	No Runoff--							
Sept. 4			2-L	3:00A	32	.07	.12	.12	.10	93	58	No Runoff--							
5			2-L			T				89	56								
6			2-L	3:56A	108	.13	.24	.12	.10	87	61	No Runoff--							
8			2-L	12:06N	97	.56	1.20	1.04	.78	84	60	No Runoff--							
9(a)*	2-L	1.03	2-L	2:30A	239	1.14	2.58	2.50	1.86	72	64	5:39A	6:45A	.356	1.60	5:44A	1.10		No Records taken.
	3-L	.65	2-L	2:30A	239	1.14	2.58	2.50	1.86	72	64	5:39A	7:18A	.290	.80	5:47A	1.17		
	4-L	.87	2-L	2:30A	239	1.14	2.58	2.50	1.86	72	64	5:34A	7:16A	.169	.40	5:39A	1.29		
9			2-L	3:34P	107	.38	.12	.12	.10	72	64	No Runoff--							
18			2-L	11:48P	13	.03	.36	---	---	82	60								
[illegible] 5-6			2-L	1:51P	1401	1.17	.44	.37	.33	70	45	No Runoff--							
[illegible]*	2-L	1.03	2-L	[illegible]	701	2.13	.91	.85	.70	69	38	[illegible]	1:02A	1.038	2.63	11:47P	1.1[illegible]		
	3-L	.65	2-L	[illegible]	701	2.13	.61	.56	.47	69	38	[illegible]	8:38A	.437	.40	7:47P	2.04		
	4-L	.87	2-L	[illegible]	701	2.13	.91	.85	.70	69	38	[illegible]	1:04A	1.008	1.98	11:43P	.91		

* Hydrographs secured for these storms.
(a) Record taken from account of Chemistry and Silts recording gage

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month October, November, December 1930

Project HAYS, KANSAS

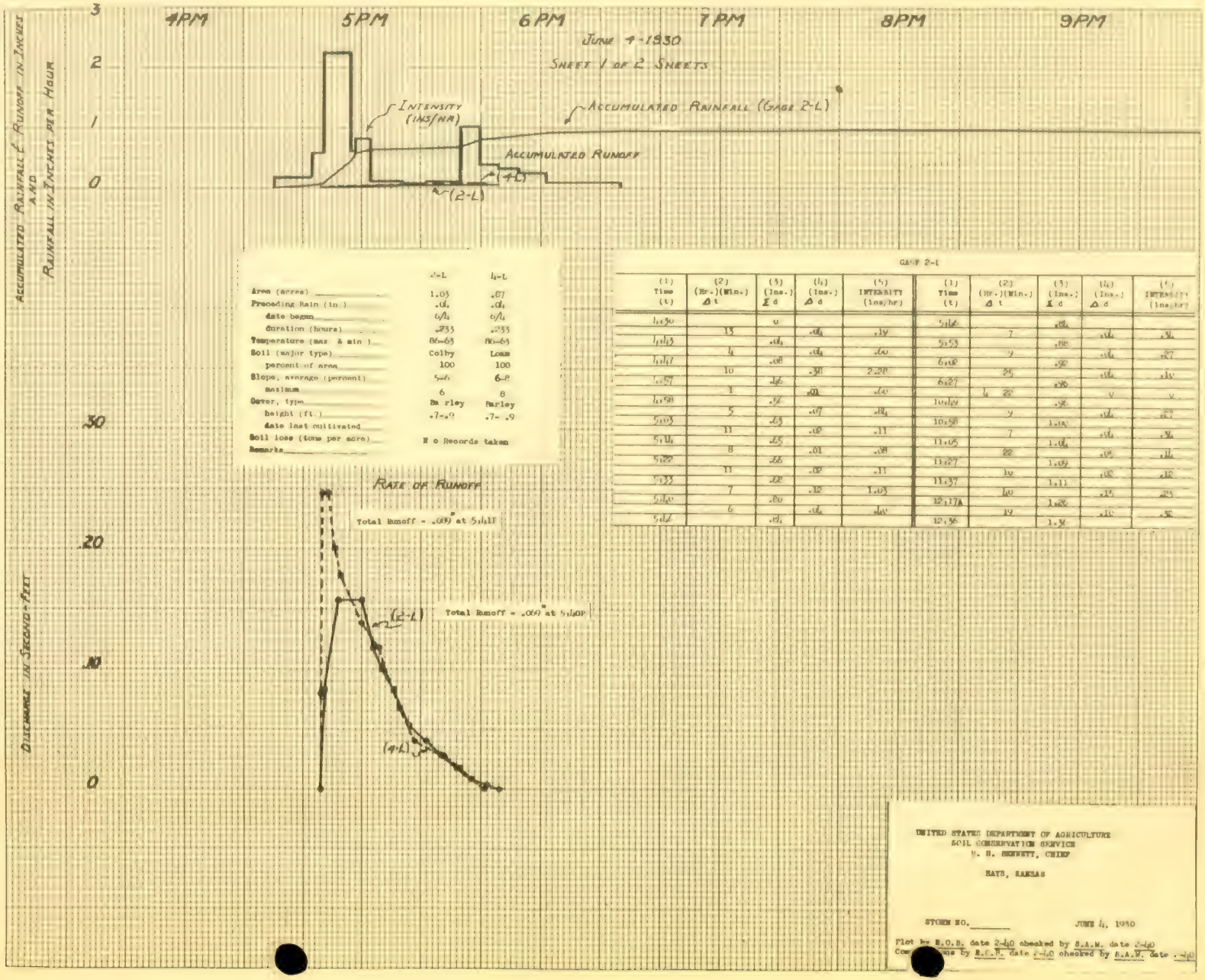
Sheet 5 of 5 sheets

Date	Watershed		Rainfall				Maximum Intensity			Temperature (Degrees F.)		Runoff					Rainfall Minus Run-off (inches)	Soil Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate: Cu. ft. sec.	Maximum Rate: Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
October 9			2-L			T				83	48	No Runoff--		---					
11(a)			2-L	1:51A	195	.38	.36	.32	.28	76	62	No Runoff--		---					
13			2-L	12:26A	428	.46	.60	.32	.20	58	48	No Runoff--		----					
20						.07				55	47								
Nov. 10		U. S.	Weather Bureau			T	Standard Gage			61	37	No Runoff--		----					
11		do	do		do	T	do		do	63	40	do	do	do					
15			2-L	2:08P	9	.08	.12	---	---	56	32	do		do					
(a)Nov. 19-20*	2-L	1.03	2-L	8:01A	1203	2.03	2.80	2.24	1.37	47	17	10:06A	10:43P	.582	2.23	10:23A	2.22	No Records taken.	
	3-L	.85	2-L	8:01A	1203	2.03	2.80	2.24	1.27	47	17	10:10A	10:11P	.502	1.35	10:23A	2.22		
	4-L	.87	2-L	8:01A	1203	2.03	2.80	2.24	1.27	47	17	10:11A	3:10P	.673	1.07	10:24A	2.13		
Nov. 29			2-L	9:22A	207	.24	.24	.16	.14	43	32	No Runoff--		----					
Dec. 3		U. S.	Weather Bureau			.03	Standard Gage			39	23	do		do					
14			2-L			.02	---	---	---	33	29	do		do					
16		U. S.	Weather Bureau			.02	Standard Gage			27	24	do		do					
17		do	do	do		.04	do		do	32	25	do		do					
25		do	do	do		T	do		do	39	19	do		do					

* Hydrographs plotted for these storms.
(a) Record taken from Bureau of Chemistry and Soils recording Gage.

June 4-1930

Sheet V of 2 Sheets



	2-L	4-L
Area (acres)	1.03	.87
Preceding Rain (in.)	.01	.01
date begun	6/1	6/1
duration (hours)	.233	.233
Temperature (max & min.)	86-63	86-63
Soil (major type)	Colby	Loam
percent of area	100	100
Slope, average (percent)	5-6	6-8
maximum	6	8
Cover, type	Barley	Barley
height (ft.)	.7-.9	.7- .9
date last cultivated		
Soil loss (tons per acre)	No Records taken	
Remarks		

GAGE 2-L

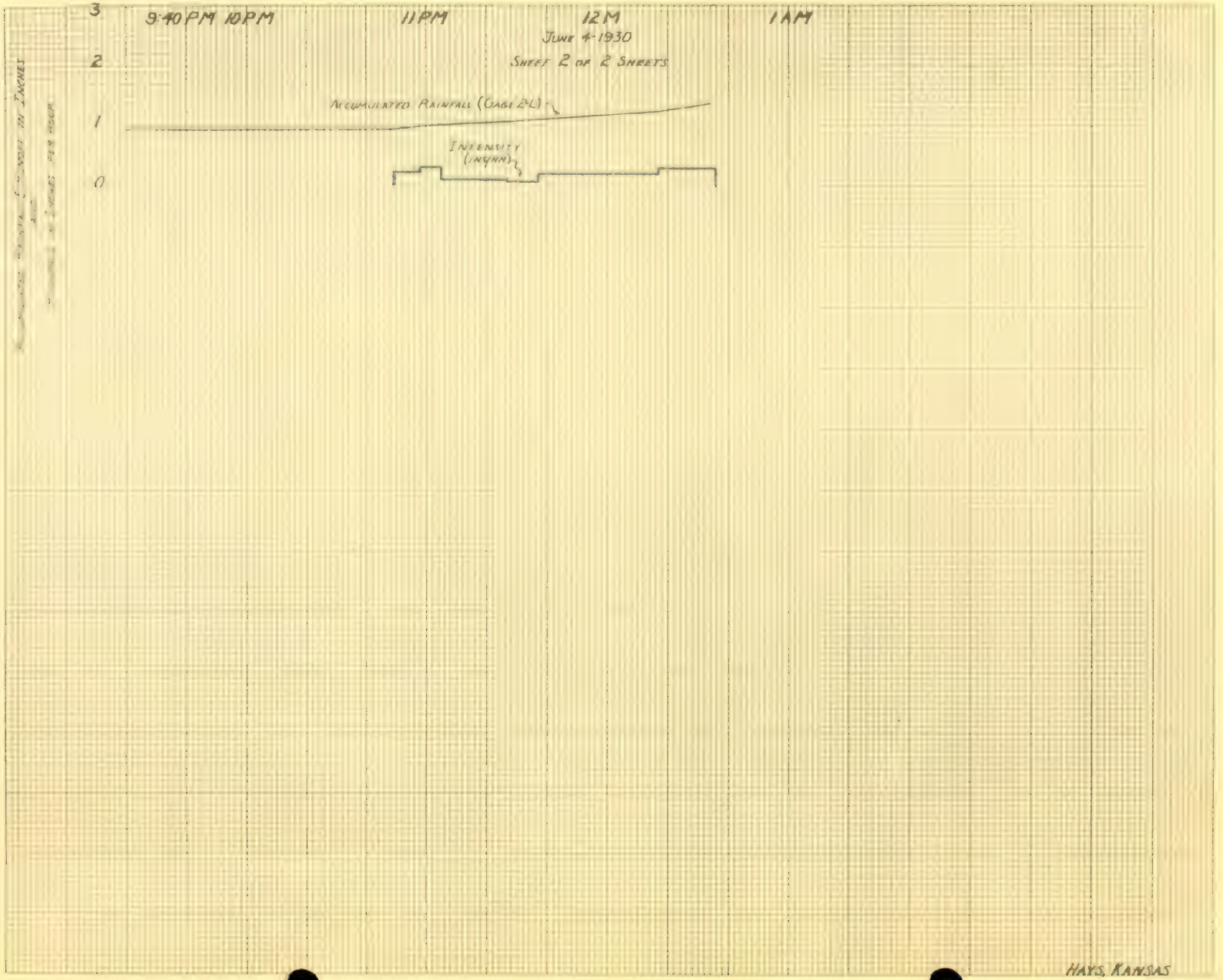
(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (ins/hr)	(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (ins/hr)
1:30		0			5:16		.28		
1:43	13	.01	.01	.14	5:53	7	.28	.01	.14
1:47	4	.01	.01	.60	6:08	9	.29	.01	.27
1:57	10	.03	.02	2.28	6:27	25	.36	.07	.15
1:58	1	.04	.01	.60	10:04	4 25	.36	0	0
5:05	5	.07	.03	.36	10:58	9	.38	.02	.27
5:16	11	.08	.01	.11	11:05	7	1.08	.70	.36
5:27	8	.01	.01	.08	11:27	22	1.09	.01	.03
5:33	11	.09	.01	.11	11:37	10	1.11	.02	.12
5:40	7	.12	.03	1.03	12:17A	40	1.28	.17	.23
5:41	6	.01	.01	.40	12:36	19	1.34	.06	.32

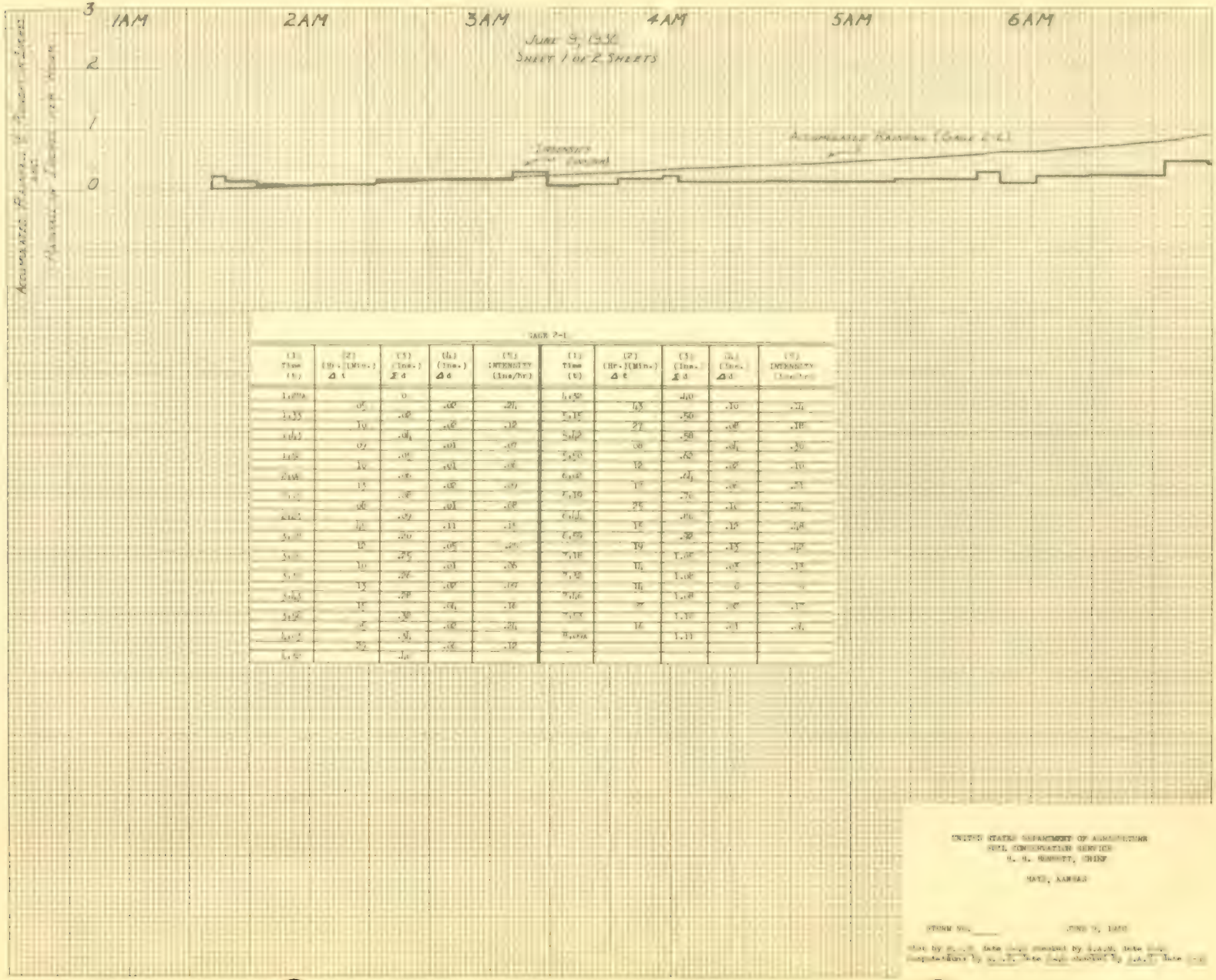
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO. _____ JUNE 4, 1930

Plot by R.O.B. date 2-40 checked by S.A.M. date 2-40
Computations by R.C.B. date 2-40 checked by S.A.M. date 2-40


3
2
1
0
9:40 PM
10 PM
11 PM
12 M
1 AM
June 4-1930
Sheet 2 of 2 Sheets
Accumulated Rainfall (Gage 24)
Intensity (in/hr)
Hays, Kansas



PAGE 2-1

(1) Time (E)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (Ins/Hr)	(1) Time (E)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins. Δ d	(5) INTENSITY (Ins/Hr)
1:00		0			4:50		4.40		
1:35	0:35	.02	.02	.21	5:15	0:25	.50	.10	.24
1:42	0:07	.04	.02	.12	5:40	0:25	.58	.08	.18
1:52	0:10	.05	.01	.07	6:00	0:20	.63	.05	.30
2:00	0:08	.06	.01	.08	6:20	0:20	.73	.10	.30
2:14	0:14	.07	.01	.07	6:40	0:20	.85	.12	.36
2:30	0:16	.08	.01	.08	7:00	0:20	.96	.11	.33
2:40	0:10	.09	.01	.06	7:15	0:15	1.01	.05	.20
2:50	0:10	.11	.02	.12	7:30	0:15	1.06	.05	.20
3:00	0:10	.20	.09	.54	7:45	0:15	1.09	.03	.12
3:10	0:10	.25	.05	.30	8:00	0:15	1.11	.02	.08
3:20	0:10	.31	.06	.36	8:15	0:15	1.12	.01	.04
3:30	0:10	.37	.06	.36	8:30	0:15	1.13	.01	.04
3:40	0:10	.43	.06	.36	8:45	0:15	1.14	.01	.04
3:50	0:10	.49	.06	.36	9:00	0:15	1.15	.01	.04
4:00	0:10	.56	.07	.42	9:15	0:15	1.16	.01	.04
4:10	0:10	.63	.07	.42	9:30	0:15	1.17	.01	.04
4:20	0:10	.70	.07	.42	9:45	0:15	1.18	.01	.04
4:30	0:10	.78	.08	.48	10:00	0:15	1.19	.01	.04
4:40	0:10	.86	.08	.48	10:15	0:15	1.20	.01	.04

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO. ____ JUNE 9, 1951

Plot by E...S Date ___ Checked by A.A.M. Date ___
Computations by ...T. Date ___ Checked by J.A.T. Date ___

7AM 8AM 9AM

June 9, 1930
Sheet 2 of 2 Sheets

Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour

3
2
1
0

Accumulated Rainfall (Gage 2-L)
Intensity (Ins/Hr)
Accumulated Runoff (4-L)
(2-L)

	2-L	4-L
Area (acres)	1.03	.87
Preceding Rain (in.)	1.36	1.36
date began	6/4	6/4
duration (hours)	8.10	8.10
Temperature (max. & min.)	65-55	65-55
Soil (major type)	Colby	Loam
percent of area	100	100
Slope, average (percent)	6-4	6-4
maximum	6	8
Cover, type	Barley	Barley
height (ft.)	.8 - 1.0	.8 - 1.0
date last cultivated		
Soil loss (tons per acre)	No Records taken.	
Remarks		

	Time	R.O.	Acc. R.O.
2-L	8:03 A	0	.029"
4-L	8:11A	0	.036"

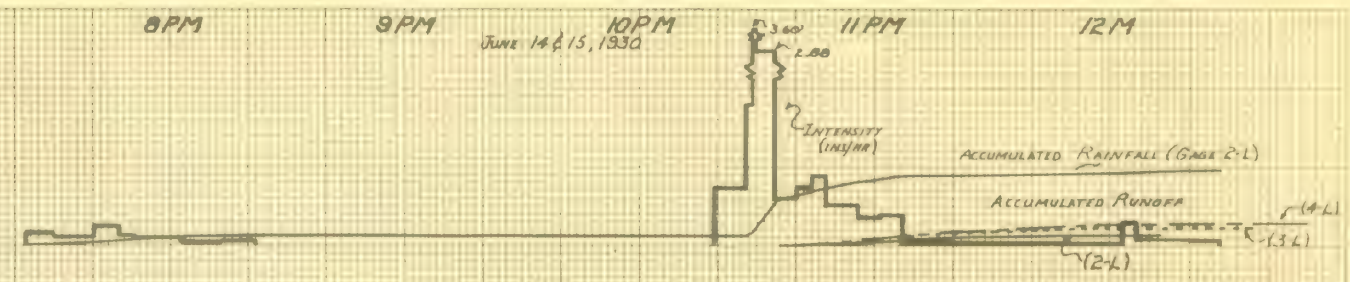
Discharge in Second-Feet

.10
.075
.050
.025
0

Rate of Runoff

(4-L)
(2-L)

Hays, Kansas

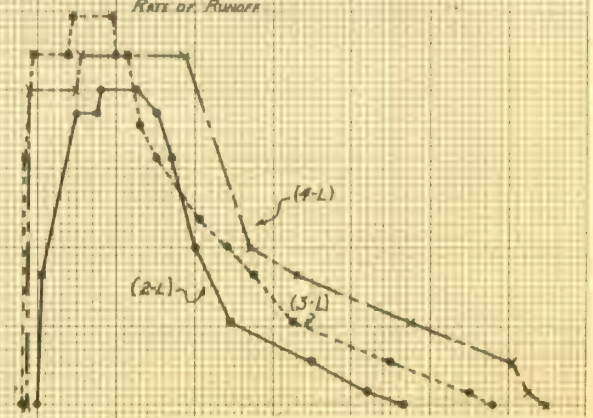


GAGE 2-L

(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (ins/hr)	(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (ins/hr)
Jun 14 7:25P		0			10:30P		.34		
7:35	07	.02	.02	.17	10:35	05	.48	.14	2.88
7:50	10	.32	.12	.12	10:40	05	.63	.05	.60
7:57	07	.43	.03	.26	10:44	04	.69	.06	.75
8:01	04	.47	.01	.15	10:48	04	.74	.05	.90
8:03	12	.48	.02	.10	10:52	08	.81	.07	.53
8:13	10	.49	.01	.06	11:01	05	.84	.03	.36
8:20	07	.50	.01	.07	11:07	06	.88	.04	.40
10:17	1 57	.12	0	0	12:03A Jun 15	56	.93	.05	.53
10:27	08	.12	.10	.75	12:07	04	.97	.04	.53
10:29	02	.20	.08	1.80	12:20	13	.99	.02	.09
10:30	01	.34	.14	3.60	12:22	02	.01	.02	.08

	Time	R.C.	Acc. R.F.
2-L	12:13A	0	.139
3-L	12:36A	0	.227
4-L	12:50A	0	.297

Rate of Runoff



	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.12	.1	.12
date began	6/10	6/10	6/10
duration (hours)	.38½	.38½	.38½
Temperature (max. & min.)	87-57	87-57	87-57
Soil (major type)	Colby	Silt	Loam
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Barley	Barley	Barley
height (ft.)	.9 - 1.1	.9 - 1.1	.9 - 1.1
date last cultivated			
Soil loss (tons per acre)	No Records taken		
Remarks			

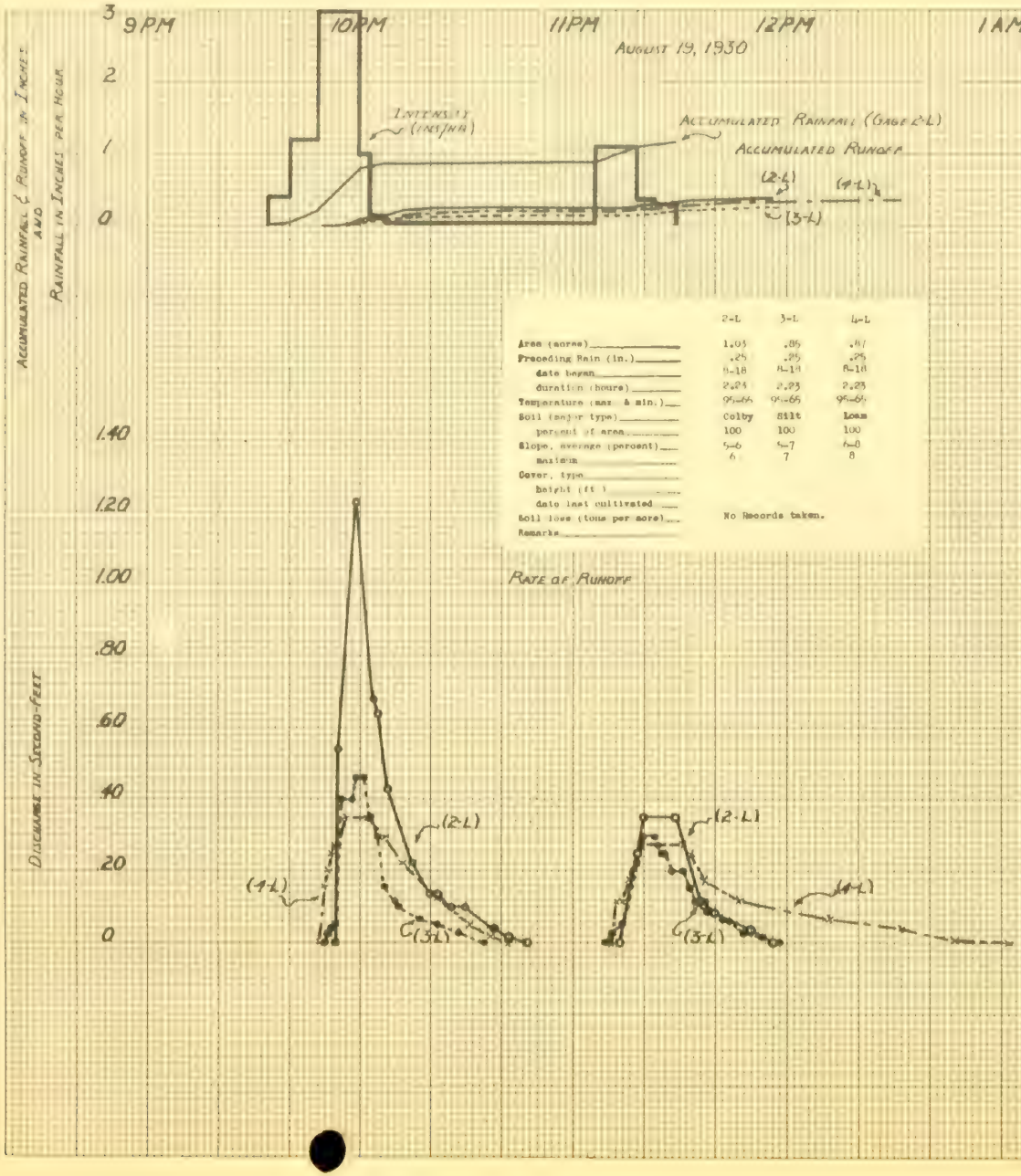
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

Hays, Kansas
Sheet 1 of 1 Sheet

STORM NO. _____ JUNE 14& 15, 1930

Plot by R.C.B. date 2-40 checked by S.A.M. date 2-40
Computations by R.C.B. date 2-40 checked by S.A.M. date 2-40



	2-L	3-L	4-L
Area (acres)	1.03	.85	.81
Preceding Rain (in.)	.25	.25	.25
date began	8-18	8-18	8-18
duration (hours)	2.23	2.23	2.23
Temperature (max. & min.)	95-66	95-65	95-64
Soil (major type)	Colby	Silt	Loam
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type			
Height (ft.)			
date last cultivated			
Soil loss (tons per acre)	No Records taken.		
Remarks			

GAGE 2-L

(1) Time (t)	(2) (Hr.)(Mins.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (ins/hr)
9:34P		0		
	06		.04	2.40
9:40		.04		
	10		.16	1.60
9:50		.20		
	08		.10	1.50
9:58		.30		
	08		.15	1.88
10:06		.45		
	08		.10	1.50
10:14		.55		
	08		.10	1.50
10:22		.65		
	08		.10	1.50
10:30		.75		
	08		.10	1.50
10:38		.85		
	05		.05	1.00
10:43		.90		
	04		.01	.15
10:47		.91		
	59		.02	.20
11:46		.93		
	12		0.22	1.10
11:18		1.15		
	05		.03	.36
11:23		1.18		
	04		.01	.15
11:27		1.19		

	Time	R.O.	Acc. R.O.
2-L	11:56P	0	.381
3-L	11:58P	0	.239
4-L	1:02A	0	.371

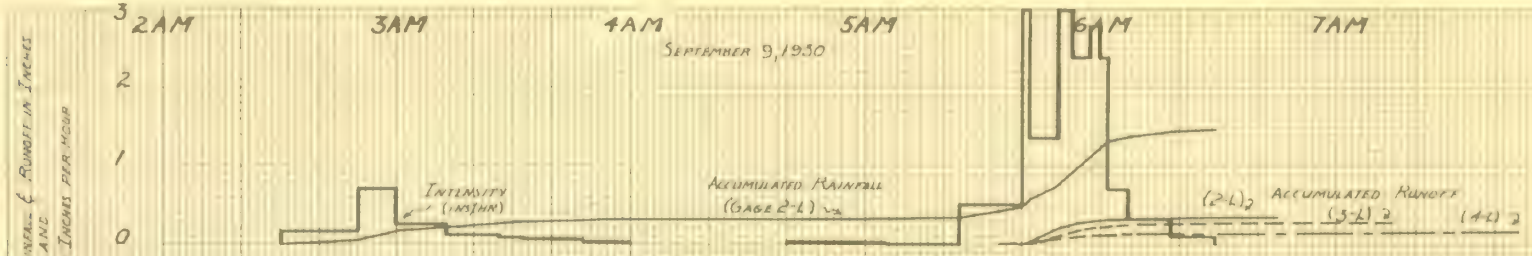
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO_____ August 19, 1930

Plot by R.C.H. date 2-40 checked by S.A.M. date 2-40
Computations by R.C.H. date 2-40 checked by S.A.M. date 2-40

Sheet 1 of 1 Sheets



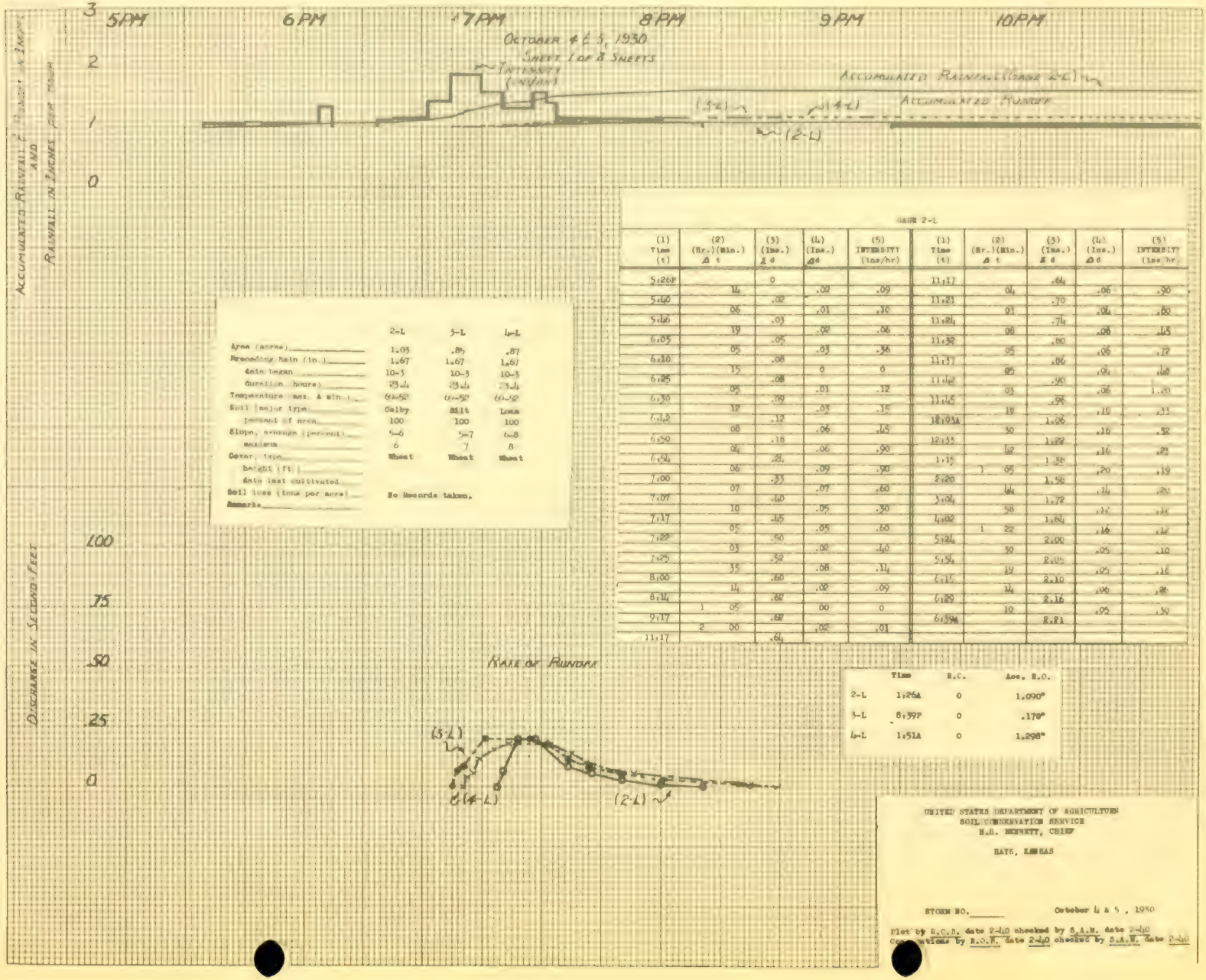
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

3
2
1
0
2.00
1.50
1.00
.50
0

GAGE 2-L

(1) Time (t)	(2) (Hr. & Min.) Δt	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (Ins./hr)	(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (Ins./hr)
[illegible] A	20	0	.14	.18	[illegible]	10	.34	.12	.72
[illegible]	10	.14	.12	.72	[illegible]	10	.46	.12	1.44
[illegible]	10	.26	.12	.72	[illegible]	10	.58	.12	1.44
[illegible]	10	.38	.12	.72	[illegible]	10	.70	.12	1.44
[illegible]	10	.50	.12	.72	[illegible]	10	.82	.12	1.44
[illegible]	10	.62	.12	.72	[illegible]	10	.94	.12	1.44
[illegible]	10	.74	.12	.72	[illegible]	10	1.06	.12	1.44
[illegible]	10	.86	.12	.72	[illegible]	10	1.18	.12	1.44
[illegible]	10	.98	.12	.72	[illegible]	10	1.30	.12	1.44
[illegible]	10	1.10	.12	.72	[illegible]	10	1.42	.12	1.44
[illegible]	10	1.22	.12	.72	[illegible]	10	1.54	.12	1.44
[illegible]	10	1.34	.12	.72	[illegible]	10



	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	1.67	1.67	1.67
date began	10-3	10-3	10-3
duration hours)	23 ¼	23 ¼	23 ¼
Temperature (max. & min.)	64-52	64-52	64-52
Soil (major type	Colby	Silt	Loam
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Wheat	Wheat	Wheat
height (ft.)			
date last cultivated			
Soil loss (tons per acre)			
Remarks	No records taken.		

GAGE 2-L

(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δd	(5) INTENSITY (ins/hr)	(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δd	(5) INTENSITY (ins/hr)
5:26P		0			11:17		.64		
	14		.02	.09		04		.06	.90
5:40		.02			11:21		.70		
	06		.01	.10		03		.04	.80
5:46		.03			11:24		.74		
	19		.02	.06		08		.08	.45
6:05		.05			11:32		.80		
	05		.03	.36		05		.06	.72
6:10		.08			11:37		.86		
	15		0	0		05		.04	.48
6:25		.08			11:42		.90		
	05		.01	.12		03		.06	1.20
6:30		.09			11:45		.96		
	12		.03	.15		18		.10	.33
6:42		.12			12:03A		1.06		
	08		.06	.45		30		.16	.32
6:50		.18			12:33		1.22		
	04		.06	.90		12		.16	.80
6:54		.24			1:15		1.38		
	06		.09	.90		1 05		.20	.19
7:00		.33			2:20		1.58		
	07		.07	.60		44		.14	.20
7:07		.40			3:04		1.72		
	10		.05	.30		58		.12	.12
7:17		.45			4:02		1.84		
	05		.05	.60		1 22		.16	.16
7:22		.50			5:24		2.00		
	03		.00	.40		30		.05	.10
7:25		.52			5:54		2.05		
	35		.08	.14		19		.05	.16
8:00		.60			6:13		2.10		
	14		.02	.09		14		.06	.28
8:14		.62			6:29		2.16		
	1 05		00	0		10		.05	.30
9:17		.62			6:39A		2.21		
	2 00		.02	.01					
11:17		.64							

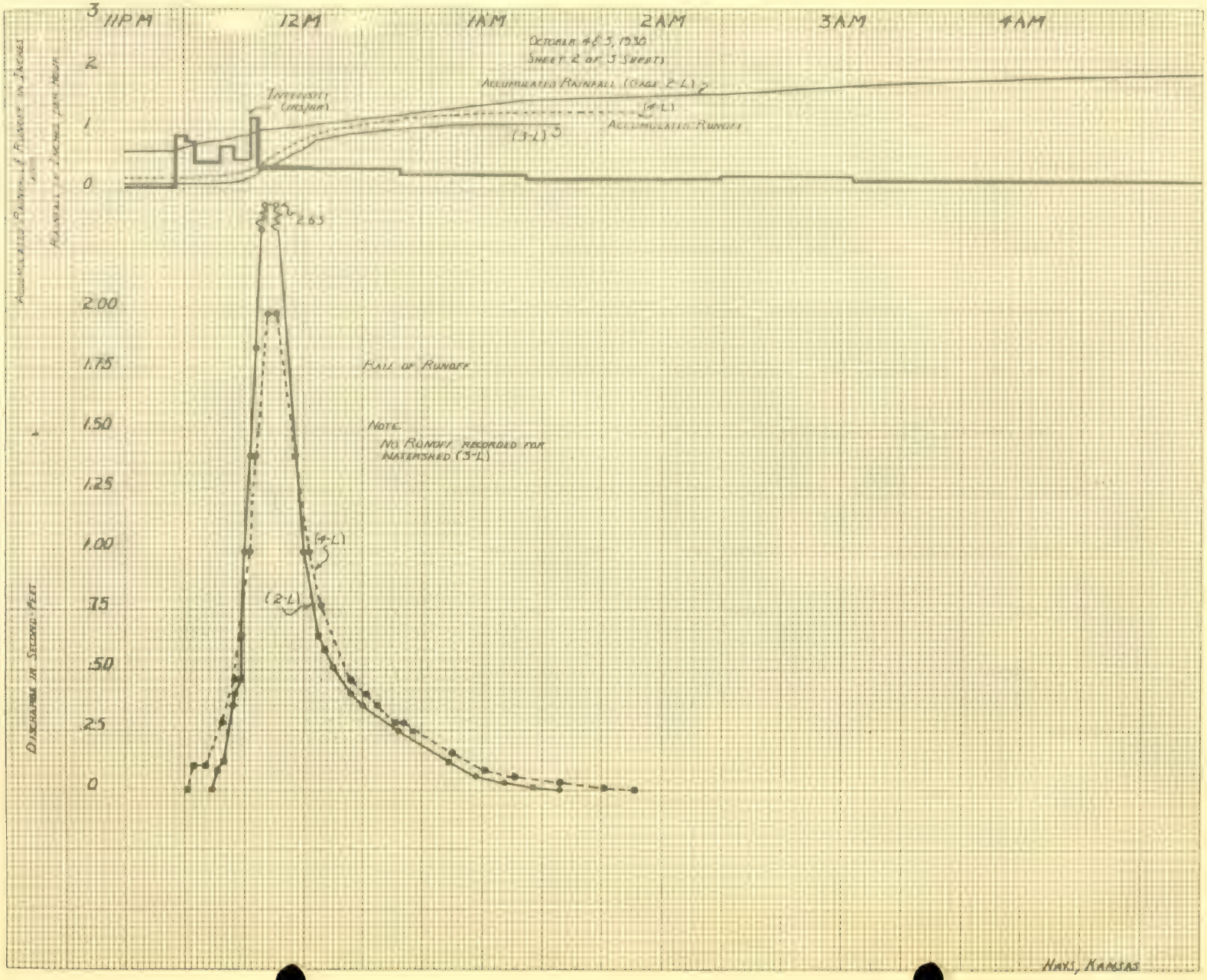
	Time	R.O.	Acc. R.O.
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3-L	8:39P	0	.170"
4-L	1:51A	0	1.296"

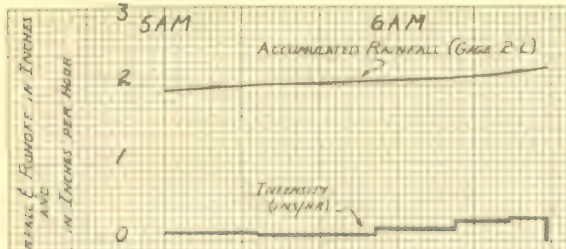
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H.H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO._____ October 4 & 5, 1930

Plot by R.O.B. date 2-40 checked by S.A.M. date 2-40
Computations by R.O.W. date 2-40 checked by S.A.W. date 2-40

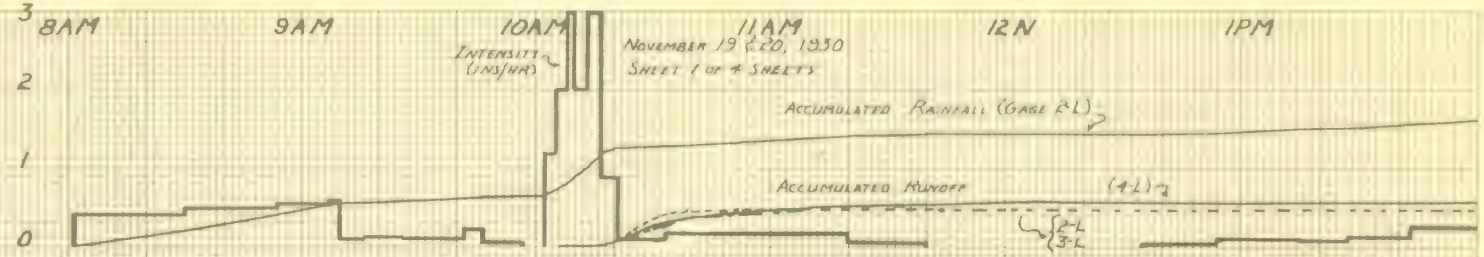

11 P M
12 M
1 A M
2 A M
3 A M
4 A M
October 4 & 5, 1930
Sheet 2 of 3 Sheets
Accumulated Rainfall (Gage 2-L)
Intensity (Inches per Hour)
(4-L)
Accumulated Runoff
(3-L)
Accumulated Rainfall & Runoff in Inches
Rainfall in Inches per Hour
2.65
2.00
1.75
Hall of Runoff
1.50
Note
No Runoff recorded for watershed (3-L)
1.25
1.00
(4-L)
.75
(2-L)
.50
.25
0
Discharge in Second Feet
Hays, Kansas



Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour

October 4 & 5, 1930
Sheet 3 of 3 Sheets

Hays Kansas



ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

2.00

1.50

1.00

.50

0

	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.08	.08	.08
date began	11/15	11/15	11/15
duration (hours)	.1148	.1148	.1148
Temperature (max & min.)	47-17	47-17	47-17
Soil (soil) type	Colby	Silt	Loam
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Wheat	Wheat	Wheat
height (ft.)	Wheat has sprouted.		
date last cultivated			
Soil loss (tons per acre)	No records taken		
Remarks			

GAGE 2-L

(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (ins/hr)
8:01A		1.72		
8:30	29	1.74	.02	.01
8:51	21	1.74	0	0
9:15	24	1.76	.08	.08
9:28	13	1.82	.06	.30
9:40	12	1.84	.02	.02
11:04	1 24	1.84	.04	.20
11:16	12	1.88	.04	.20
11:29	13	1.91	.03	.14
11:43	14	1.92	.01	.04
11:54	11	1.95	.03	.17
12:20A	26	1.96	.01	.02
1:21	1 01	1.96	0	0
2:53	1 32	1.98	.02	.01
3:30	37	1.98	0	0
3:45	15	2.02	.04	.16
4:04	19	2.03	.01	.03

RATE OF RUNOFF

(2-L)

(4-L)

(3-L)

GAGE 2-L

(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (ins/hr)	(1) Time (t)	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (ins/hr)
8:01A		0			10:17		1.20		
8:30	29	.2	.20	.12	10:21	04	1.26	.06	.90
8:54	24	.4	.20	.50	10:33	12	1.28	.02	.10
9:07	13	.52	.12	.55	10:53	20	1.34	.06	.18
9:10	03	.55	.03	.60	11:10	17	1.40	.06	.18
9:17	06	.56	.01	.10	11:20	10	1.42	.02	.12
9:27	10	.58	.02	.12	11:40	20	1.44	.02	.06
9:42	15	.61	.03	.11	12:35P	55	1.44	0	0
9:47	05	.63	.02	.24	12:54	19	1.46	.02	.06
9:57	10	.64	.01	.06	1:15	21	1.48	.02	.06
10:02	05	.64	0	0	1:27	12	1.50	.02	.10
10:05	03	.70	.06	1.20	1:43	16	1.50	.04	.15
10:08	03	.80	.10	2.00	2:00	17	1.54	.04	.14
10:10	02	.90	.10	3.00	2:20	20	1.58	.04	.12
10:13	03	1.00	.10	2.00	2:36	16	1.60	.02	.08
10:15	02	1.10	.10	3.00	2 36	2 36	1.60	0	0
10:17	02	1.20	.10	3.00	5:12	34	1.62	.02	.04
					6:06		1.62		

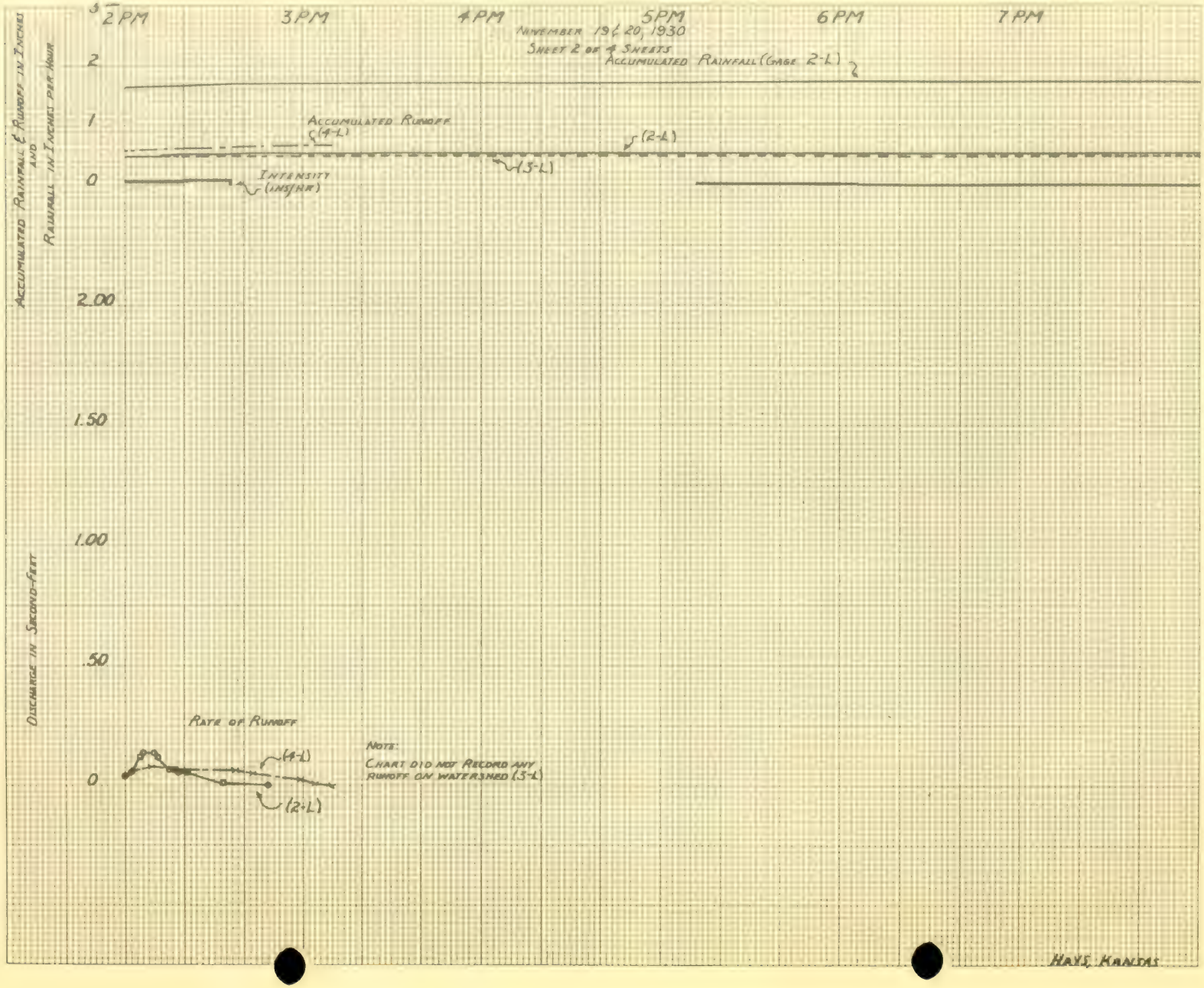
	Time	R.O.	Acc. R.O.
2-L	10:43P	0	.582"
3-L	10:11P	0	.502"
4-L	3:10P	0	.679"

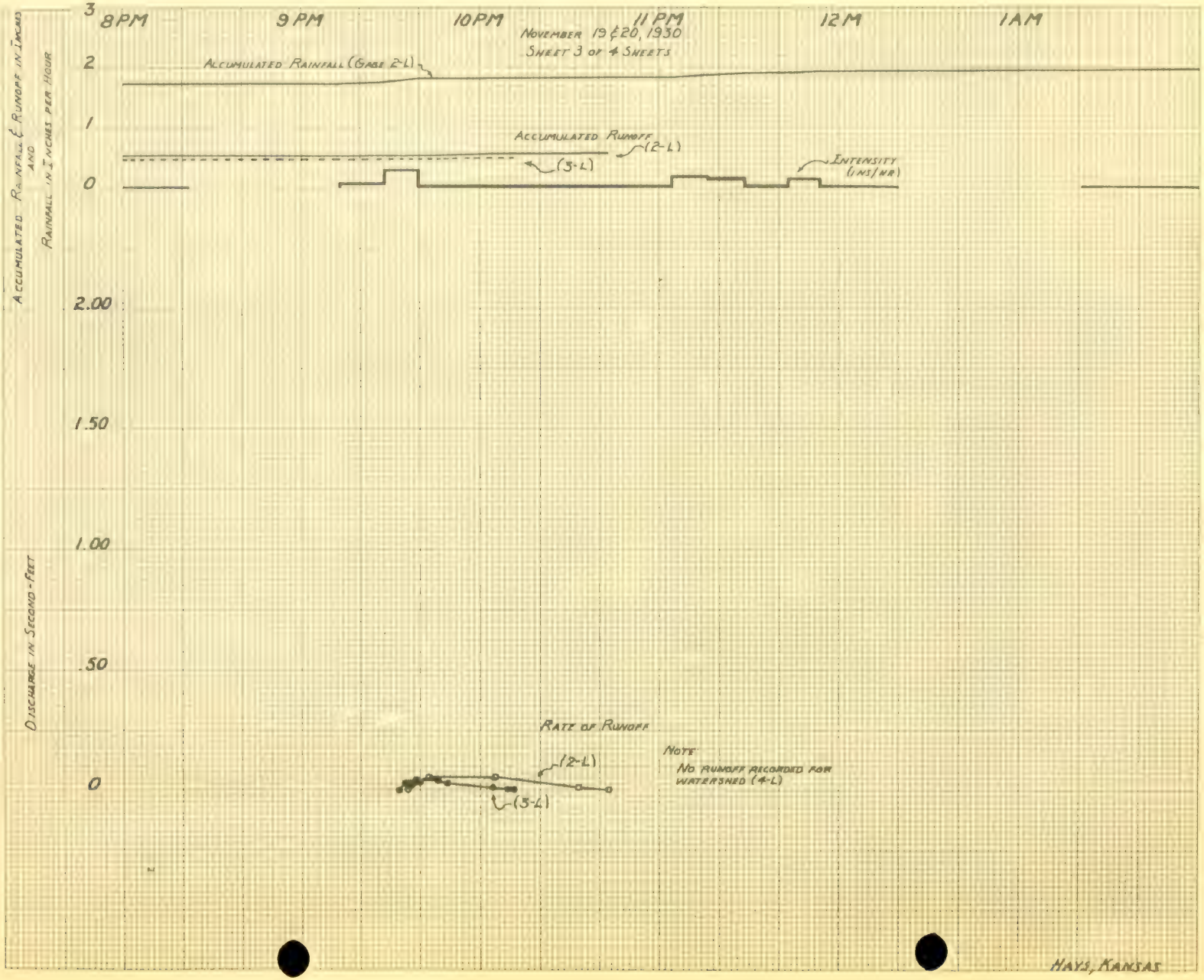
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

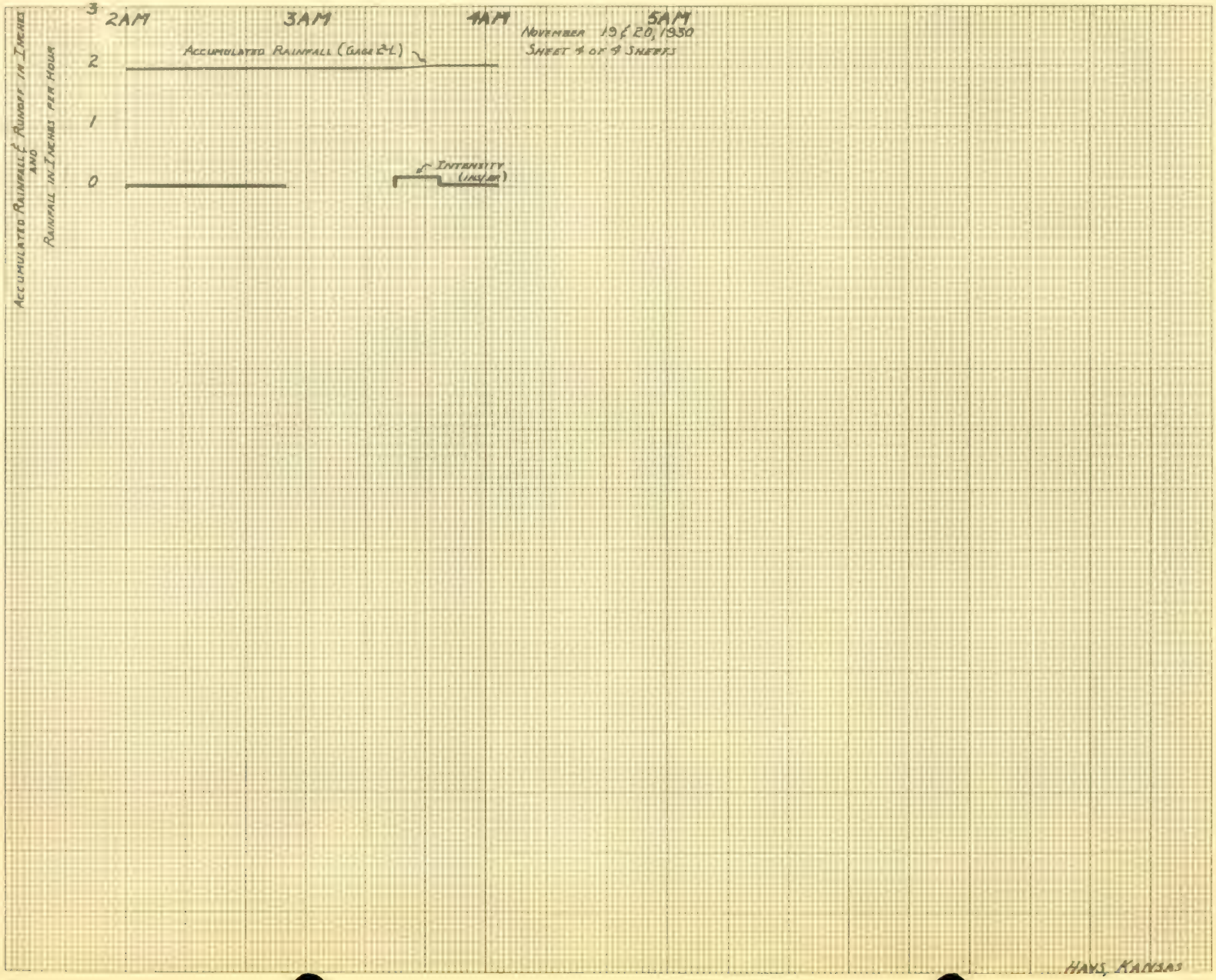
HAYS, KANSAS

STORM NO.____ November 19 & 20, 1930

Plot by R.O.S. date 2-40 checked by S.A.N. date 2-40
Computations by R.O.S. date 2-40 checked by S.A.N. date 2-40


2 PM
3 PM
4 PM
5 PM
6 PM
7 PM
NOVEMBER 19 & 20, 1930
SHEET 2 OF 4 SHEETS
ACCUMULATED RAINFALL (GAGE 2-L)
ACCUMULATED RUNOFF (1-L)
(2-L)
(3-L)
INTENSITY (INS/HR)
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
2
1
0
2.00
1.50
1.00
.50
DISCHARGE IN SECOND-FEET
RATE OF RUNOFF
(1-L)
(2-L)
0
NOTE:
CHART DID NOT RECORD ANY RUNOFF ON WATERSHED (3-L)
HAYS, KANSAS


8PM
9PM
10PM
11PM
12M
1AM
November 19 & 20, 1930
Sheet 3 of 4 Sheets
Accumulated Rainfall (Gage 2-L)
Accumulated Runoff (2-L)
(3-L)
Intensity (ins/hr)
Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour
3
2
1
0
Discharge in Second-Feet
2.00
1.50
1.00
.50
0
Rate of Runoff
(2-L)
(3-L)
Note
No runoff recorded for watershed (4-L)
Hays, Kansas


ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
3
2
1
0
2AM
3AM
4AM
5AM
ACCUMULATED RAINFALL (GAGE 2-L)
INTENSITY (INCHES)
NOVEMBER 19 & 20, 1930
SHEET 4 OF 9 SHEETS
HAYS, KANSAS

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH April, May, 19 31

SHEET 2 OF 5 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12368

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Apr. 21			U. S. WEATHER BUREAU			.08	Standard Gage			50	28	No	Runoff						
23			do	do	do	.15	do		do	50	39	do		do					
24			do	do	do	.62	do		do	48	37	do		do					
25			do	do	do	.40	do		do	44	34	do		do					
26			do	do	do	.02	do		do	57	30	do		do					
30			do	do	do	.17	do		do	63	48	do		do					
May 1			do	do	do	.06	do		do	70	43	do		do					
4			do	do	do	T	do		do	71	52	do		do					
5			do	do	do	.50	do		do	57	44	do		do					
8			do	do	do	.02	do		do	63	49	do		do					
9			do	do	do	.01	do		do	64	42	do		do					
11			do	do	do	.02	do		do	60	42	do		do					
19			do	do	do	T	do		do	66	49	do		do					
21			do	do	do	.02	do		do	44	41	do		do					
22			do	do	do	1.06	do		do	61	29	do		do					
28			do	do	do	.02	do		do	77	56	do		do					

Form S

PROJE
U. S.

DA

(1

Apr.

May

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH May, June, July, 1931

SHEET 3 OF 5 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12368

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
May 30			U. S.	WEATHER	BUREAU	.14	Standard Gage			74	50	No		Runoff					
June 1			do	do	do	.04	do		do	87	53	do		do					
4			do	do	do	.04	do		do	90	67	do		do					
5			do	do	do	T	do		do	86	63	do		do					
10			2-L	3:30A	365	.27	.84	.32	.16	89	65	do		do					
11			2-L	--	—	.08	--	--	--	76	58	do		do					
12			2-L	--	--	.13	--	--	--	86	55	do		do					
12			2-L	11:00P	75	.21	.24	.12	.12	86	55	do		do					
14*	2-L	1.03	2-L	1:54A	163	.83	2.68	1.91	1.03	84	61	2:43A	3:09A	.023	.15	2:47A	.81	.025	
*	3-L	.85	2-L	do	do	.83	do	do	do			2:34A	3:31A	.117	.30	2:43A	.71	.078	
*	4-L	.87	2-L	do	do	.83	do	do	do			2:38A	3:24A	.109	.46	2:42A	.72	.195	
*	3-N	2.95	3-N	--	--	1.08	Standard Gage					2:38A	3:00A	.011	.25	2:39A	1.07	**	
14			2-L	6:00P	175	.23	.48	.28	.16	84	61	No		Runoff					
21*	2-L	1.03	2-L	3:13A	223	2.89	3.40	2.35	1.77	92	66	3:37A	7:17A	.576	.95	4:35A	2.31	.252	
*	3-L	.85	2-L	do	do	2.89	do	do	do			3:32A	7:29A	1.011	.95	4:37A	1.88	.645	
*	4-L	.87	2-L	do	do	2.89	do	do	do			3:31A	7:14A	1.007	2.08	4:36A	1.88	1.740	
*	3-N	2.95	3-N	--	--	3.18	Standard Gage					3:32A	8:31A	.743	1.23	4:35A	2.44	**	
July 1			2-L	--	--	.17	--	--	--	86	70	No		Runoff					
1			2-L	6:05P	95	.25	.48	.40	.24	86	70	do		do					

*Hydrographs plotted for these storms.

**Soil Losses were not measured.

Form S. C

PROJECT

U. S. GO

DATE

(1)

May

June

July

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH July, August, September, October, 19 31

SHEET 4 OF 5 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12363

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
July 4*	2-L	1.03	2-L	3:01A	78	.78	2.98	2.17	1.26	83	66	3:12A	3:47A	.073	.32	3:16A	.71	.023	
*	3-L	.85	2-L	do	do	.78	do	do	do			3:08A	4:09A	.168	.35	3:15A	.61		
*	3-N	2.95	3-N	do	do	.78	do	do	do			3:09A	3:41A	.027	.51	3:11A	.75	**	
4*	3-L	.85	2-L	11:35A	90	.37	.67	.52	.42	83	66	Recorder pen stuck--No Record.						.099	
	3-N	2.95	3-N	do	do	.44	do	do	do			11:49A	12:33P	.030	.33	12:03P	.41	**	
12			2-L	--	--	.04	--	--	--	91	67	No	Runoff						
Aug. 1			2-L	4:45P	31	.22	--	--	--	93	73	do		do					
7			2-L	--	--	.04	--	--	--	102	70	do		do					
8			2-L	--	--	.02	--	--	--	89	71	do		do					
9			2-L	12:50A	490	1.36	2.40	1.96	1.22	77	63	do		do					
17			2-L	12:41P	12	.25	1.32	--	--	85	59	do		do					
23 &24			2-L	9:00P	525	.50	.24	.20	.16	94	62	do		do					
Sept. 20			2-L	10:25P	--	.20	--	--	--	99	65	do		do					
25			2-L	--	--	.04	--	--	--	77	45	do		do					
Oct. 1			2-L	1:50P	315	.31	.72	.24	.12	80	57	do		do					
10			2-L	11:10P	80	.16	.60	.20	.10	95	57	do		do					
12			2-L	6:15A	725	.63	.72	.36	.26	58	48	do		do					

*Hydrographs plotted for these storms.

**Soil losses were not measured.

Form

PROJ

Jul

Aug

Sep

Oc

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

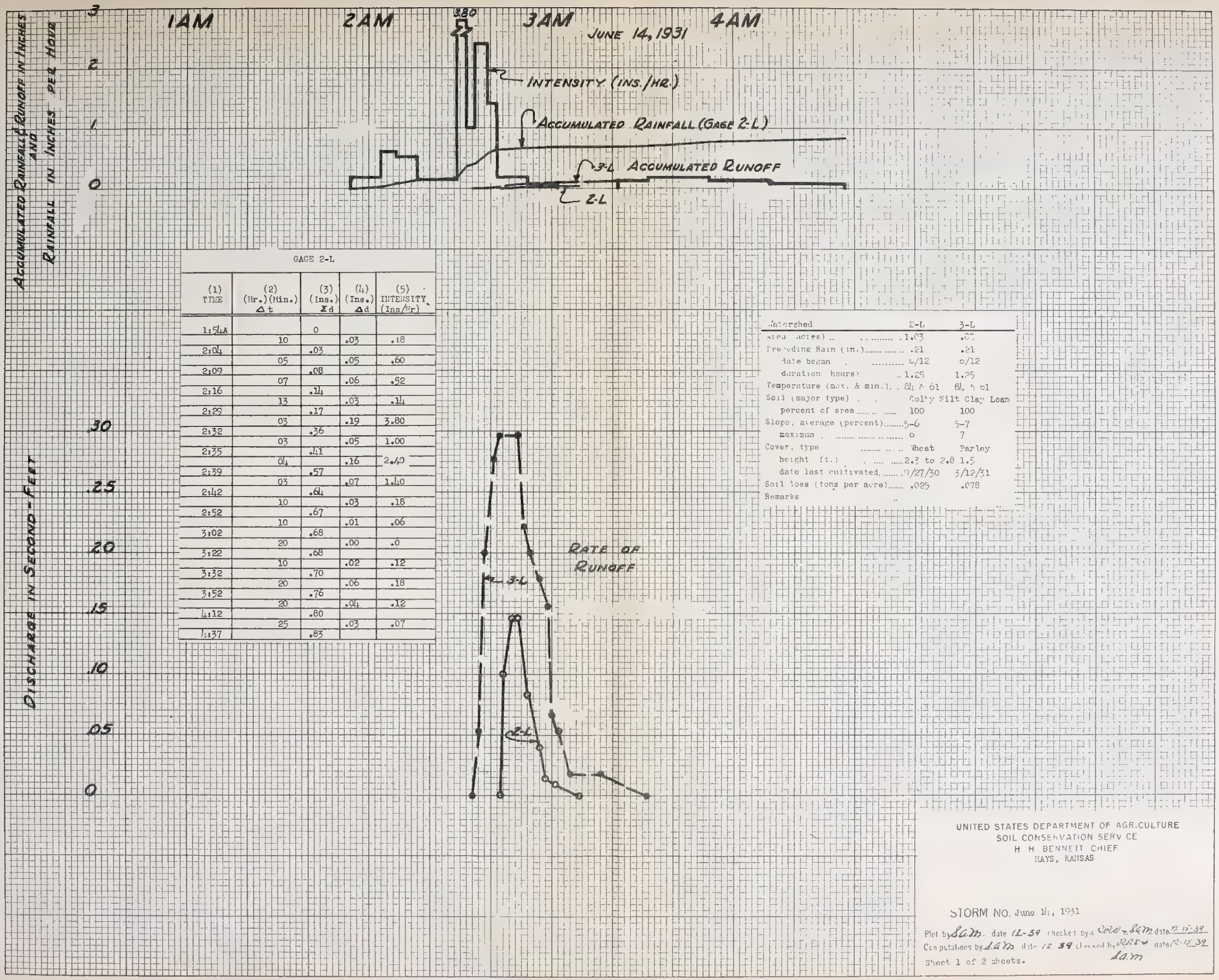
PROJECT HAYS, KANSAS

MONTH November, December, 1931

SHEET 5 OF 5 SHEETS

U. S. GOVERNMENT PRINTING OFFICE S—12368

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Nov. 11			2-L	4:29A	101	.42	1.08	.64	.40	67	38	No	Runoff						
14			2-L	10:45A	285	.53	.36	.24	.20	55	45	do		do					
19			2-L	2:20P	712	.92	.84	.52	.42	48	41	do		do					
24			2-L	10:12A	158	.30	.24	.20	.14	36	18	do		do					
26			U. S. WEATHER BUREAU			.50	Standard Gage			33	30	do		do					
28			do	do	do	.07	do		do	36	31	do		do					
29			do	do	do	.19	do		do	35	17	do		do					
Dec. 8			do	do	do	.20	do		do	39	32	do		do					
9			do	do	do	.06	do		do	39	32	do		do					
10			do	do	do	.10	do		do	47	37	do		do					
11			do	do	do	.10	do		do	51	28	do		do					
13			do	do	do	T	do		do	33	19	do		do					
14			do	do	do	T	do		do	45	16	do		do					
31			do	do	do	.08	do		do	39	28	do		do					



GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
1:54A		0		
	10		.03	.18
2:04		.03		
	05		.05	.60
2:09		.08		
	07		.06	.52
2:16		.14		
	13		.03	.14
2:29		.17		
	03		.19	3.80
2:32		.36		
	03		.05	1.00
2:35		.41		
	04		.16	2.40
2:39		.57		
	03		.07	1.40
2:42		.64		
	10		.03	.18
2:52		.67		
	10		.01	.06
3:02		.68		
	20		.00	.0
3:22		.68		
	10		.02	.12
3:32		.70		
	20		.06	.18
3:52		.76		
	20		.04	.12
4:12		.80		
	25		.03	.07
4:37		.83		

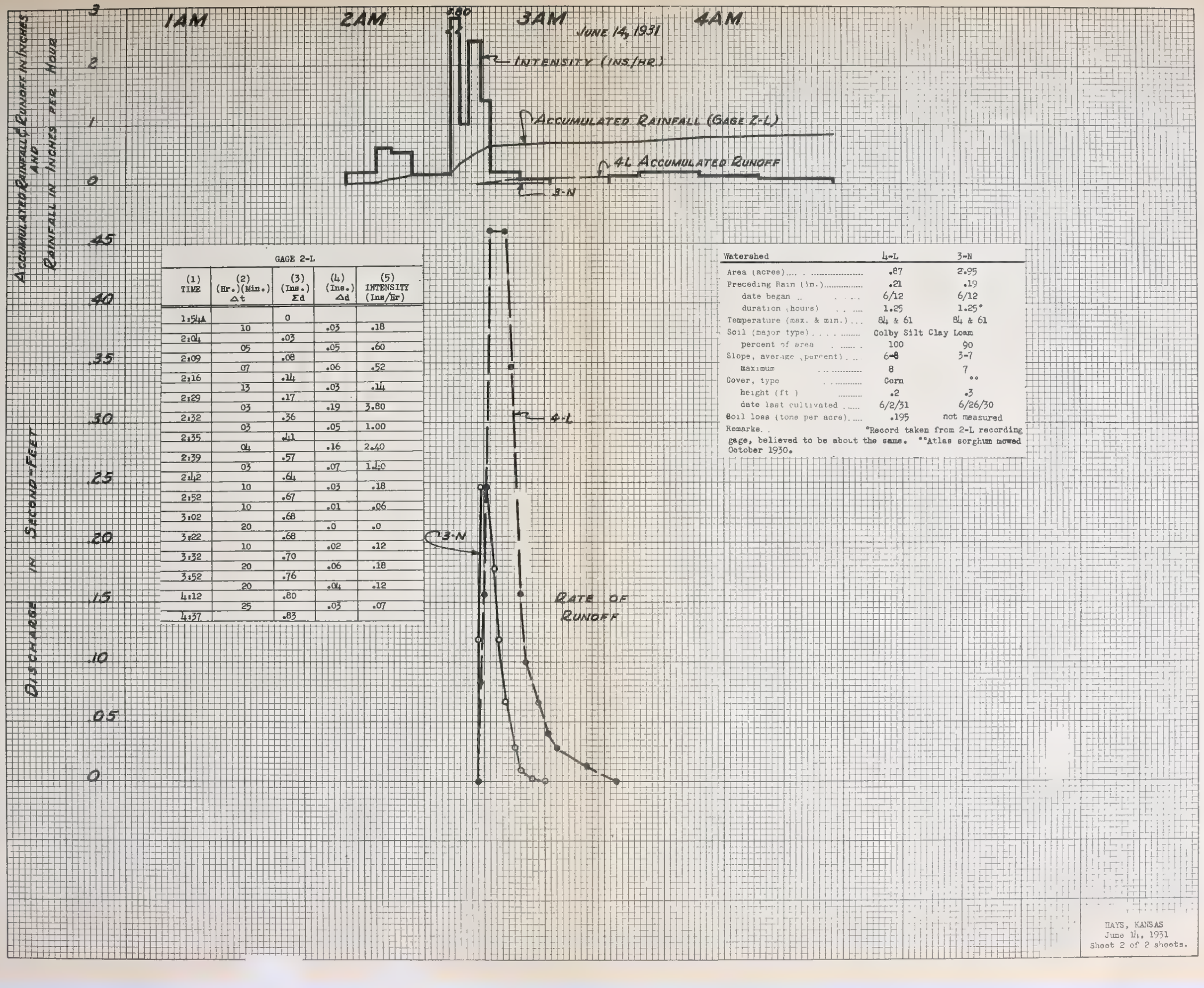
Watershed	2-L	3-L
Area (acres)	1.03	.85
Preceding Rain (in.)	.21	.21
date began	6/12	6/12
duration hours)	1.25	1.25
Temperature (max. & min.)	84 & 61	84 & 61
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	100
Slope, average (percent)	5-6	5-7
maximum	6	7
Cover, type	Wheat	Barley
height ft.)	2.3 to 2.8	1.5
date last cultivated	9/27/30	5/12/31
Soil loss (tons per acre)	.025	.078
Remarks		

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT CHIEF
HAYS, KANSAS

STORM NO. June 14, 1931

Plot by S.A.M. date 12-39 checked by [illegible] date 12-15-39
Computations by S.A.M. date 12-39 checked by [illegible] date 12-12-39
S.A.M.

Sheet 1 of 2 sheets.



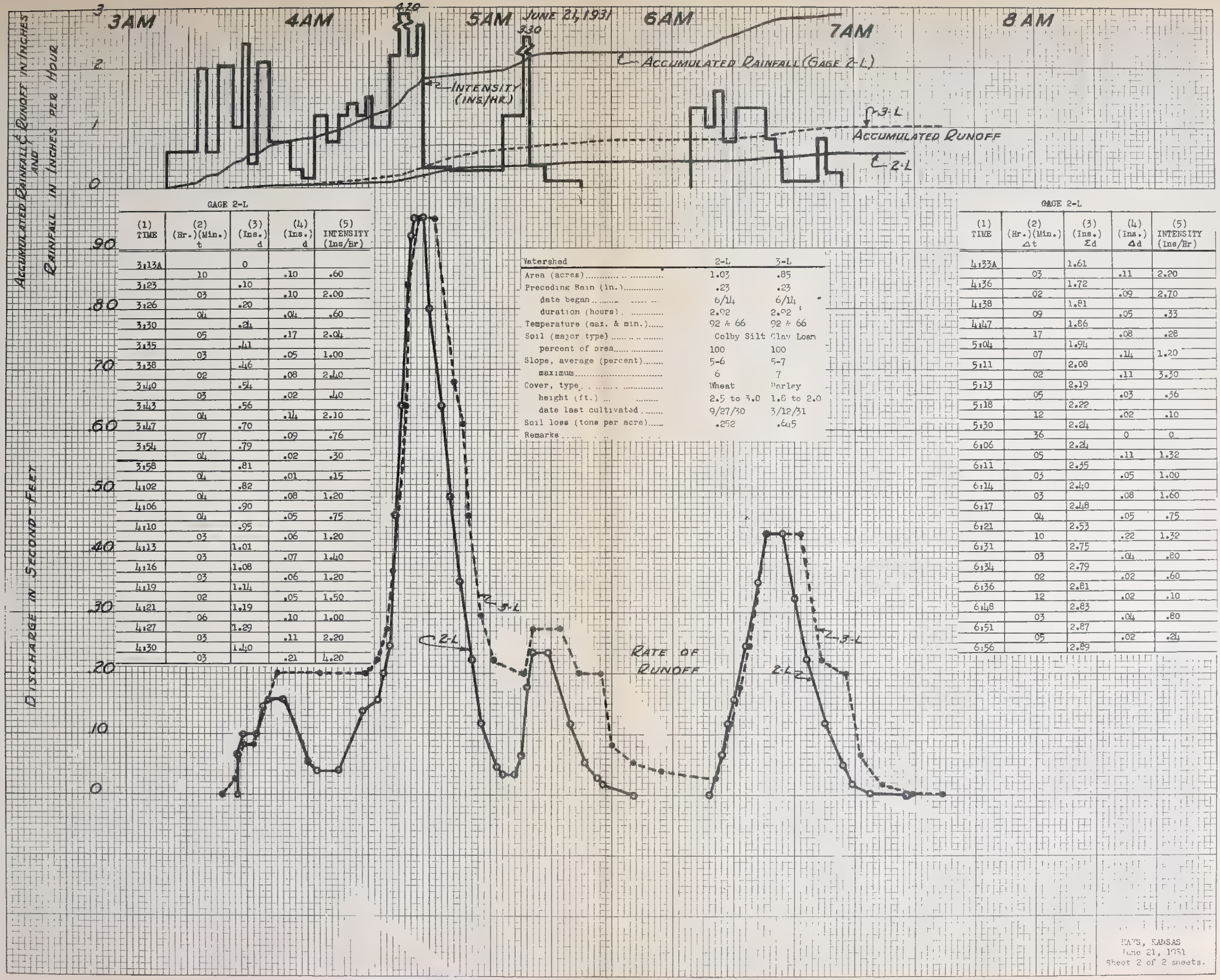
GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
1:54A		0		
	10		.03	.18
2:04		.03		
	05		.05	.60
2:09		.08		
	07		.06	.52
2:16		.14		
	13		.03	.14
2:29		.17		
	03		.19	3.80
2:32		.36		
	03		.05	1.00
2:35		.41		
	04		.16	2.40
2:39		.57		
	03		.07	1.40
2:42		.64		
	10		.03	.18
2:52		.67		
	10		.01	.06
3:02		.68		
	20		.0	.0
3:22		.68		
	10		.02	.12
3:32		.70		
	20		.06	.18
3:52		.76		
	20		.04	.12
4:12		.80		
	25		.03	.07
4:37		.83		

Watershed	4-L	3-N
Area (acres)	.87	2.95
Preceding Rain (in.)	.21	.19
date began	6/12	6/12
duration (hours)	1.25	1.25*
Temperature (max. & min.)	84 & 61	84 & 61
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	90
Slope, average (percent)	6-8	3-7
maximum	8	7
Cover, type	Corn	**
height (ft)	.2	.3
date last cultivated	6/2/31	6/26/30
Soil loss (tons per acre)	.195	not measured

Remarks. *Record taken from 2-L recording gage, believed to be about the same. **Atlas sorghum mowed October 1930.

HAYS, KANSAS
June 14, 1931
Sheet 2 of 2 sheets.



GAGE 2-L

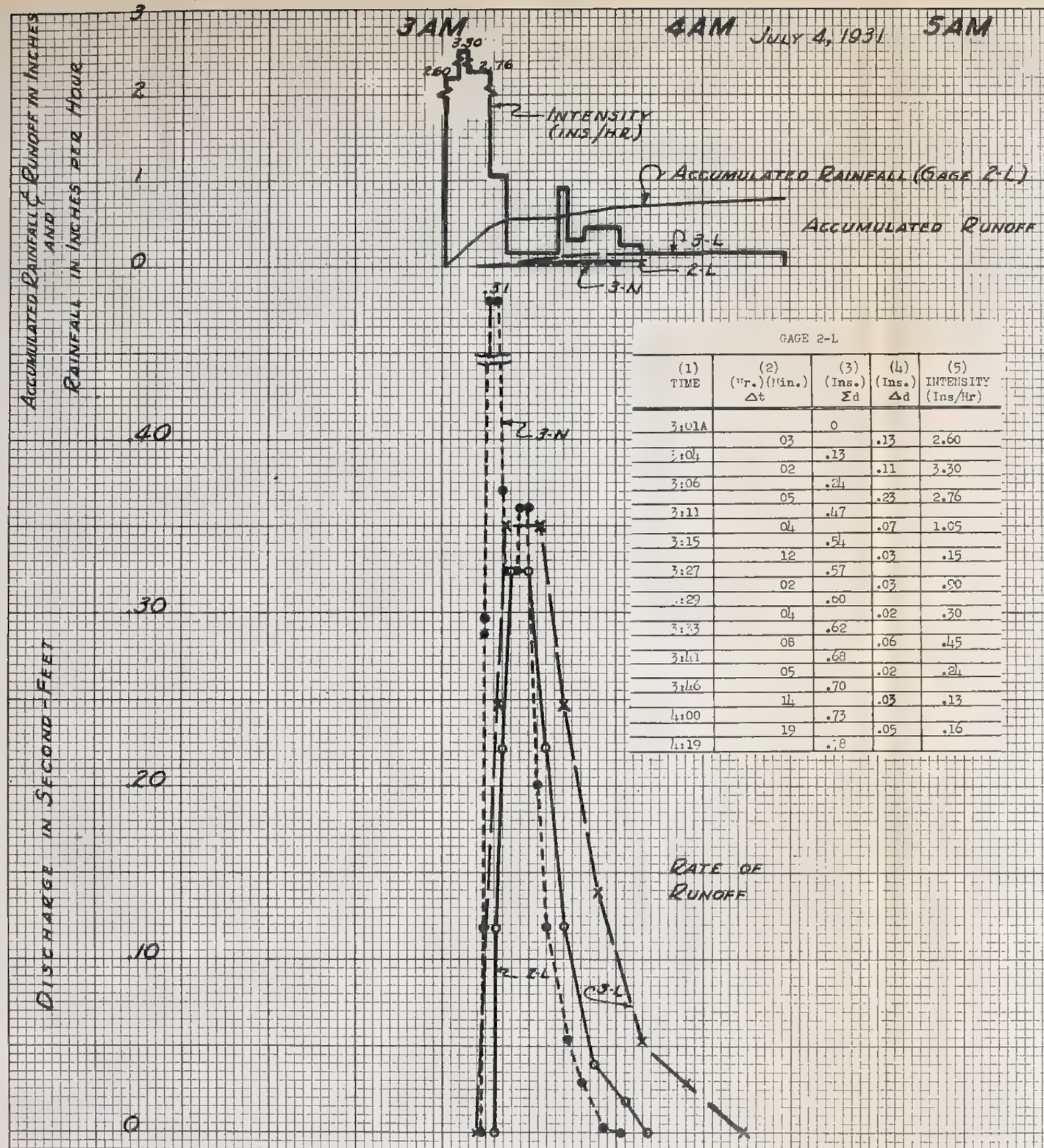
(1) TIME	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
3:13A		0		
	10		.10	.60
3:23		.10		
	03		.10	2.00
3:26		.20		
	04		.04	.60
3:30		.24		
	05		.17	2.04
3:35		.41		
	03		.05	1.00
3:38		.46		
	02		.08	2.40
3:40		.54		
	03		.02	.40
3:43		.56		
	04		.14	2.10
3:47		.70		
	07		.09	.76
3:54		.79		
	04		.02	.30
3:58		.81		
	04		.01	.15
4:02		.82		
	04		.08	1.20
4:06		.90		
	04		.05	.75
4:10		.95		
	03		.06	1.20
4:13		1.01		
	03		.07	1.40
4:16		1.08		
	03		.06	1.20
4:19		1.14		
	02		.05	1.50
4:21		1.19		
	06		.10	1.00
4:27		1.29		
	03		.11	2.20
4:30		1.40		
	03		.21	4.20

Watershed	2-L	3-L
Area (acres)	1.03	.85
Preceding Rain (in.)	.23	.23
date began	6/14	6/14
duration (hours)	2.02	2.02
Temperature (max. & min.)	92 & 66	92 & 66
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	100
Slope, average (percent)	5-6	5-7
maximum	6	7
Cover, type	Wheat	Barley
height (ft.)	2.5 to 3.0	1.8 to 2.0
date last cultivated	9/27/30	3/12/31
Soil loss (tons per acre)	.252	.645
Remarks		

GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
4:33A		1.61		
	03		.11	2.20
4:36		1.72		
	02		.09	2.70
4:38		1.81		
	09		.05	.33
4:47		1.86		
	17		.08	.28
5:04		1.94		
	07		.14	1.20
5:11		2.08		
	02		.11	3.30
5:13		2.19		
	05		.03	.36
5:18		2.22		
	12		.02	.10
5:30		2.24		
	36		0	0
6:06		2.24		
	05		.11	1.32
6:11		2.35		
	03		.05	1.00
6:14		2.40		
	03		.08	1.60
6:17		2.48		
	04		.05	.75
6:21		2.53		
	10		.22	1.32
6:31		2.75		
	03		.04	.80
6:34		2.79		
	02		.02	.60
6:36		2.81		
	12		.02	.10
6:48		2.83		
	03		.04	.80
6:51		2.87		
	05		.02	.24
6:56		2.89		

HAYS, KANSAS
June 21, 1931
Sheet 2 of 2 sheets.



GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
3:01A		0		
	03		.13	2.60
3:04		.13		
	02		.11	3.30
3:06		.24		
	05		.23	2.76
3:11		.47		
	04		.07	1.05
3:15		.54		
	12		.03	.15
3:27		.57		
	02		.03	.90
3:29		.60		
	04		.02	.30
3:33		.62		
	08		.06	.45
3:41		.68		
	05		.02	.24
3:46		.70		
	14		.03	.13
4:00		.73		
	19		.05	.16
4:19		.78		

Watershed	2-L	3-L	3-N
Area (acres)	1.03	.85	2.95
Preceding Rain (in.)	.23	.23	.42
date began	7/1	7/1	7/1
duration (hours)	1.58	1.58	1.58°
Temperature (max. & min.)	83 - 66	83 - 66	83 - 66
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	90
Slope, average (percent)	5-6	5-7	3-7
maximum	6	7	7
Cover, type	Wheat	Barley	°°
height (ft.)	2.5 to 3.0	2.0 to 2.3	.3
date last cultivated	6/27/30	3/12/31	6/20/30
Soil loss (tons per acre)	.023	°°°	not measured

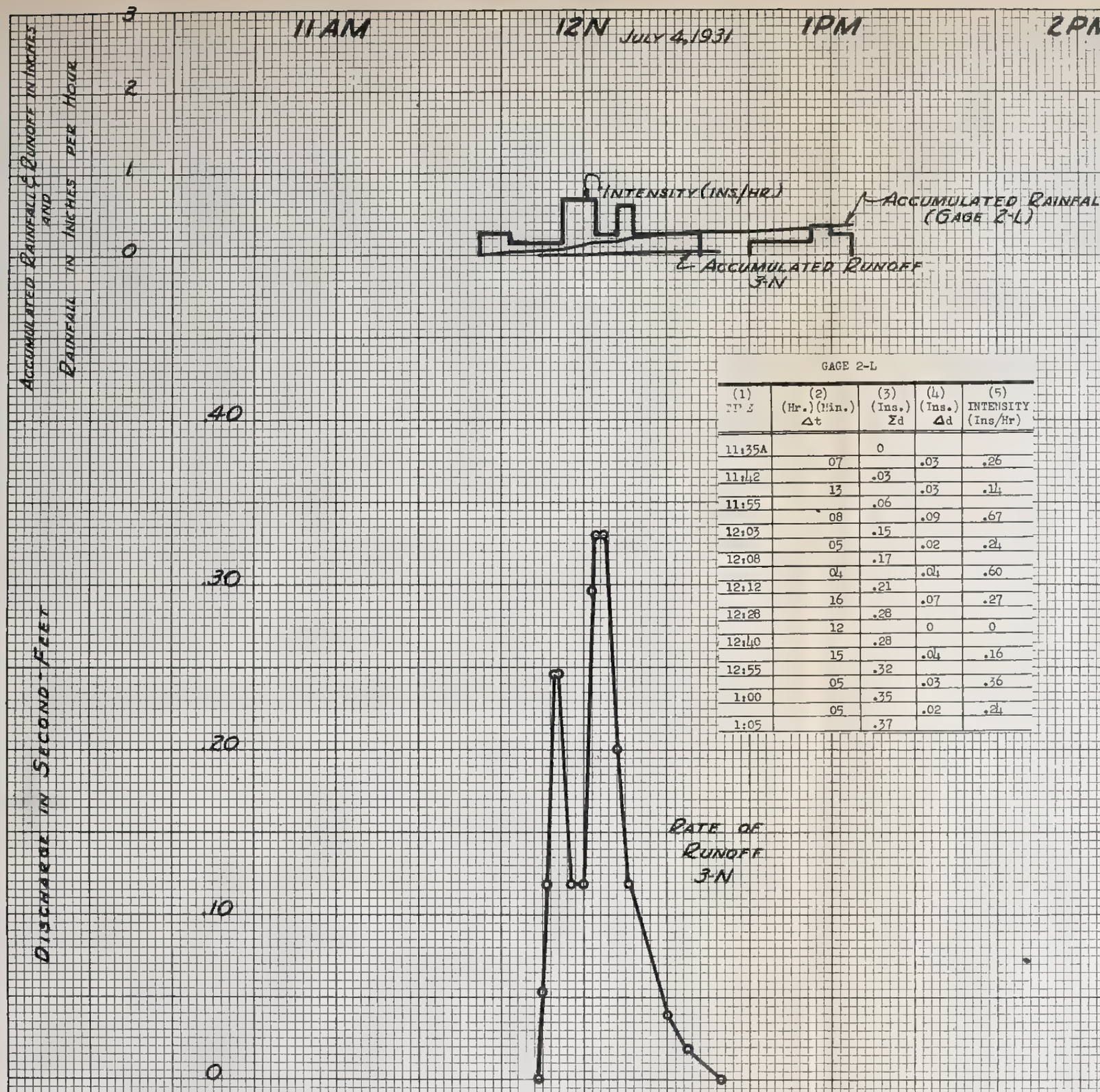
Remarks °Record taken from 2-L recording gage, believed to be about the same. °°Atlas sorghum mowed October 1930. °°°Soil loss is recorded next rain July 4.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT CHIEF.
HAYS, KANSAS

STORM NO July 4, 1931 AM

Plot by L.A.M. date 12-39 checked by L.A.M. date 2-10-39
Computations by L.A.M. date 12-39 checked by L.A.M. date 2-10-39

Sheet 1 of 1 sheet.



GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
11:35A		0		
	07		.03	.26
11:42		.03		
	13		.03	.14
11:55		.06		
	08		.09	.67
12:03		.15		
	05		.02	.24
12:08		.17		
	04		.04	.60
12:12		.21		
	16		.07	.27
12:28		.28		
	12		0	0
12:40		.28		
	15		.04	.16
12:55		.32		
	05		.03	.36
1:00		.35		
	05		.02	.24
1:05		.37		

Watershed	3-N
Area (acres)	2.95
Preceding Rain (in.)	.78
date began	7/4
duration (hours)	1.30*
Temperature (max. & min.)	83 & 66
Soil (major type)	Colby Silt Clay Loam
percent of area	90
Slope, average (percent)	3-7
maximum	7
Cover, type	Atlas sorghum, mowed Oct. 1930
height (ft.)	.3
date last cultivated	6/26/30
Soil loss (tons per acre)	not measured
Remarks	* Record taken from 2-L recording gage

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF,
HAYS, KANSAS

STORM No. July 4, 1931 PM

Plot by L.A.M. date 12-39 checked by [illegible] date 12-12-39
Computations by L.A.M. date 12-39 checked by L.A.M. date 12-15-39

Sheet 1 of 1 sheet.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

MONTH January, February, 1932

PROJECT HAYS, KANSAS

SHEET 1 OF 7 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12363

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Jan. 3			U. S. WEATHER	BUREAU	T		Standard	Gage		37	20	No	Runoff						2-L Terraced area. Colby silt clay loam. Average land slope 5 to 6%. Vertical spacing 4'. Grade constant 4". Blank listed 4/2. Lister ridges curled in 5/17. Planted to corn 6/3. Corn cultivated 6/29. Corn harvested November.
4			do	do	do	.80	do		do	31	25	do		do					
5			do	do	do	.40	do		do	30	23	do		do					
10			do	do	do	.15	do		do	33	21	do		do					3-L. Terraced Area. Colby silt clay loam. Average land slope 5 to 7%. Vertical spacing 4'. Grade constant 4". Wheat harvested 7/9. Blank listed 7/21. Lister ridges curled in 8/22. Blank listed 11/29.
13			do	do	do	.01	do		do	21	12	do		do					
14			do	do	do	.02	do		do	17	11	do		do					
15			do	do	do	T	do		do	31	-2	do		do					4-L. Terraced Area. Colby silt clay loam. Average land slope 6 to 8%. Vertical spacing 4'. Grade constant 4". Plowed by one-way disc 3/31. Subsoil packed 3/31. Seeded to barley 4/2. Barley harvested 7/9. Plowed by moldboard plow 7/16. Plowed by tandem disc 8/19. Plowed by one-way disc 9/8. Subsoil packed 9/8. Plowed by one-way disc 9/26. Subsoil packed 9/26. Seeded to wheat 9/28.
16			do	do	do	.04	do		do	39	19	do		do					
25			do	do	do	.40	do		do	38	20	do		do					
31			do	do	do	T	do		do	5	-2	do		do					
Febr. 3			do	do	do	T	do		do	14	4	do		do					
4			do	do	do	.05	do		do	31	-2	do		do					2-N. Terraced Area. Colby silt clay loam. Average land slope 3 to 7%. Vertical spacing 2'. Grade constant level. Wheat harvested 7/7. Plowed by one-way disc 7/18. Plowed by tandem disc 8/11. Plowed by one-way disc 9/8. Subsoil packed 9/8. Plowed by one-way disc 9/28. Subsoil packed 9/28. Seeded to wheat 9/29.
13			do	do	do	.30	do		do	34	26	do		do					
14			do	do	do	.03	do		do	30	27	do		do					
15			do	do	do	.12	do		do	32	22	do		do					

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH March, April, 1932

SHEET 2 OF 7 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12363

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Mar. 4			U. S. WEATHER	BUREAU	.18	Standard		Gage		38	17	No		Runoff					3-N. Terraced Area. Colby silt clay loam. Average land slope 3 to 7%. Vertical spacing 3'. Grade constant level. Wheat harvested 7/7. Plowed by one-way disc 7/18. Subsoil packed 7/18. Plowed by tandem disc 8/11. Plowed by one-way disc 9/8. Subsoil packed 9/8. Plowed by one-way disc 9/28. Subsoil packed 9/28. Seeded to wheat 9/30.
6			do	do	do	.02	do		do	30	5	do		do					
7			do	do	do	.02	do		do	11	4	do		do					
8			do	do	do	.20	do		do	18	5	do		do					
20			do	do	do	.20	do		do	54	29	do		do					1.61 AG. Pasture Area. Colby silt clay loam. Average land slope 5 to 8%. Cover of native buffalo and gramma grass. No grazing except by cattle during the growing season. Not over-grazed at any time.
21			do	do	do	.20	do		do	46	21	do		do					
30			do	do	do	T	do		do	70	29	do		do					
April 9			do	do	do	T	do		do	66	43	do		do					
10			do	do	do	.47	do		do	50	32	do		do					
16			do	do	do	.04	do		do	77	43	do		do					
18			do	do	do	.01	do		do	56	49	do		do					
19			do	do	do	1.16	do		do	70	50	do		do					
23			do	do	do	T	do		do	75	60	do		do					
24			do	do	do	.09	do		do	62	43	do		do					
25			do	do	do	.24	do		do	56	47	do		do					

1932

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

MONTH April, May, 1932

PROJECT HAYS, KANSAS

SHEET 3 OF 7 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12368

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
April 26			U. S. WEATHER BUREAU			.02	Standard Gage			52	34	No	Runoff						
27			do	do	do	.01	do		do	50	34	do		do					
28			do	do	do	.21	do		do	59	43	do		do					
30			do	do	do	T	do		do	68	42	do		do					
May 2			do	do	do	.57	do		do	74	45	do		do					
4			2-L	2:05P	5	.10	1.20	.40	.20	86	54	do		do					
7			2-L	---	---	.01	---	---	---	80	48	do		do					
9			2-L	6:35P	10	.05	.36	.20	.10	79	44	do		do					
15			2-L	3:15P	82	.07	.24	.16	.08	82	58	do		do					
23+	2-L	1.03	2-L	3:04P	94	1.31	4.08	2.09	1.99	87	60	3:40P	4:32P	.225	.75	3:51P	1.08	.252	
+	3-L	.85	2-L	do	do	1.31	do	do	do	do	do	3:22P	4:32P	.169	.41	3:49P	1.14	.183	
+	4-L	.87	2-L	do	do	1.31	do	do	do	do	do	3:22P	5:02P	.179	.31	3:46P	1.13	1.250	
+	2-N	2.81	3-N	do	do	1.35	do	do	do	do	do	3:26P	4:08P	.015	.23	3:48P	1.33		
+	3-N	2.95	3-N	do	do	1.35	do	do	do	do	do	3:24P	4:12P	.012	.25	3:48P	1.34		
+	1.61AG	1.61	U. S. WEATHER BUREAU			1.28	Standard Gage			do	do	3:50P	4:34P	.004	.04	3:56P	1.28		
25+	2-L	1.03	2-L	8:34P	134	1.01	3.24	1.43	.84	82	58	8:40P	10:38P	.449	.58	9:31P	.56	.195	
+	3-L	.85	2-L	do	do	1.01	do	do	do	do	do	8:39P	10:58P	.359	.30	9:31P	.65	.281	
+	4-L	.87	2-L	do	do	1.01	do	do	do	do	do	8:39P	11:17P	.314	.30	9:49P	.70	.212	
+	2-N	2.81	3-N	do	do	1.07	do	do	do	do	do	8:40P	10:46P	.034	.10	8:46P	1.04	.015	
+	3-N	2.95	3-N	do	do	1.07	do	do	do	do	do	8:39P	10:12P	.021	.08	9:30P	1.05	.024	
28			2-L	---	---	.18	---	---	---	60	45	No	Runoff						

+ Hydrographs plotted for these storms.

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Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH June, 1932.

SHEET 4 OF 7 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12368

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
June 4			2-L	1:50A	65	.28	1.44	.84	.48	82	60	No	Runoff						
5*	3-L	.85	2-L	12:45A	348	.48	1.04	.73	.59	76	60	5:51A	7:07A	.049	.08	6:17A	.43		
*	4-L	.87	2-L	do	do	.48	do	do	do	do	do	5:53A	7:05A	.039	.05	6:17A	.44		
5			2-L	6:25P	135	.27	.36	.28	.18	76	60	No	Runoff						
8*	2-L	1.03	2-L	8:51P	197	2.62	8.44#	8.44#	4.56#	81	64	9:09P	1:00A	1.852	4.08	9:24P	.77	.613(d)	
*	3-L	.85	2-L	do	do	2.62	do	do	do	do	do	9:06P	10:49P	1.538	2.37	9:28P	1.08	.788(d)	
*	4-L	.87	2-L	do	do	2.62	do	do	do	do	do	9:07P	10:59P	1.566	2.08	9:34P	1.05	.625(d)	
*	2-N	2.81	3-N	do	do	2.45	do	do	do	do	do	9:02P	11:32P	.284	.82	9:12P	2.17	.165(d)	
*	3-N	2.95	3-N	do	do	2.45	do	do	do	do	do	9:08P	11:52P	.330	1.23	9:20P	2.12	.083(d)	
	1.61AG	1.61	U. S. WEATHER		BUREAU	3.49	Standard Gage			do	do	Estimated		2.153	---	---	1.34		
11			2-L	5:43A	5	.05	.60	.20	.10	80	55	No	Runoff						
16			2-L	---	---	T	---	---	---	94	67	No	Runoff						
18-19*	2-L	1.03	2-L	7:40P	935	1.51	2.28	1.48	.76	88	59	7:42P	11:50A	(b) .562(e)	.37	3:51A	.95		
*	3-L	.85	2-L	do	do	1.51	do	do	do	do	do	10:37P	12:12P	(b) .199	.12	3:50A	1.31		
*	4-L	.87	2-L	do	do	1.51	do	do	do	do	do	10:38P	11:25A	(b) .096	.05	3:48A	1.41		
	2-N	2.81	3-N	do	do	1.48	do	do	do	do	do	Estimated		.018	---	---	1.46		
25*	2-L	1.03	2-L	12:50P	168	.56	3.56	1.72	.98	86	66	1:09P	2:04P	.153	.59	1:13P	.41		
*	3-L	.85	2-L	do	do	.56	do	do	do	do	do	1:07P	1:55P	.059	.22	1:13P	.50		
*	4-L	.87	2-L	do	do	.56	do	do	do	do	do	1:08P	1:56P	.066	.25	1:10P	.49		
	2-N	2.81	3-N	do	do	.50	do	do	do	do	do	Estimated	(c)	.005	---	---	.49		
	3-N	2.95	3-N	do	do	.50	do	do	do	do	do	do	(c)	.007	---	---	.49		
26*	2-L	1.03	2-L	2:45A	345	1.39	2.40	1.97	1.77	76	65	2:50A	5:52A	1.006	1.84	4:52A	.38	1.003(e)	
*	3-L	.85	2-L	do	do	1.39	do	do	do	do	do	2:47A	6:04A	.750	1.11	4:54A	.64	.249(e)	
*	4-L	.87	2-L	do	do	1.39	do	do	do	do	do	2:47A	6:00A	.765	1.09	4:53A	.62	.208(e)	
*	2-N	2.81	3-N	do	do	1.28	do	do	do	do	do	4:25A	6:20A	.074	.37	4:47A	1.21	.020(e)	
*	3-N	2.95	3-N	do	do	1.26	do	do	do	do	do	4:25A	5:31A	.061	.44	4:46A	1.22	.016(e)	
*	1.61AG	1.61	U. S. WEATHER		BUREAU	1.73	Standard Gage			do	do	4:32A	6:13A	.241	.76	5:01A	1.49	---	

(a) Pen did not ink continuously. Part of hydrograph estimated.
\# Clock stopped-Rainfall estimated at time of storm by observer.
* Hydrograph plotted for these storms.
(b) June 19, 1932
(c) Estimated from amount in sedimentation box
(d) include losses for storms of June 5.
(e) include losses for June 18-19, 25.

Form S

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April

May

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month June, July, August, 1932.

Project HAYS, KANSAS

Sheet 5 of 7 sheets

U. S. GOVERNMENT PRINTING OFFICE 8—12368

Date	Watershed		Rainfall				Maximum Intensity			Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate Cu. ft. sec.	Maximum Rate Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
June 26			2-L	3:00P	15	.09	.48	.36	.18	78	65	No	Runoff						
July 4-5			2-L	10:49P	513	.30	.84	.32	.18	102	62	do		do					
24			2-L	1:08A	157	.44	.84	.36	.28	89	67	do		do					
29			2-L	3:54A	476	.96	2.28	2.08	1.32	87	69	do		do					
30			2-L	7:45P	25	.45	2.16	1.16	.90	91	66	do		do					
Aug. 1*	2-L	1.03	2-L	5:10P	40	1.58	4.80	4.12	3.11	96	71	5:18P	6:38P	.900	2.48	5:31P	.68	1.147	
*	3-L	.85	2-L	do	do	1.58	do	do	do	do	do	5:21P	7:13P	.315	.99	5:38P	1.26	.203	
*	4-L	.87	2-L	do	do	1.58	do	do	do	do	do	5:19P	6:05P	.128	.42	5:41P	1.45	.203	
*	2-N	2.81	3-N	do	do	1.42	do	do	do	do	do	5:23P	6:53P	.015	.08	5:36P	1.40	.016	
*	3-N	2.95	3-N	do	do	1.42	do	do	do	do	do	5:20P	6:08P	.034	.30	5:33P	1.39	.042	
*	1.61AG	1.61	U. S. WEATHER		BUREAU	1.08	Standard Gage			do	do	5:38P	6:16P	.078	.48	5:50P	1.00	.005	
4			2-L	---	---	.05	---	---	---	96	68	No	Runoff						
8-9			2-I	10:25P	225	.55	.36	.28	.26	93	57	do		do					
12*	2-I.	1.03	2-L	8:08P	97	1.76	2.70	2.55	2.10	95	70	8:21P	11:12P	.907	2.02	8:38P	.85	.514	
*	3-L	.85	2-L	do	do	1.76	do	do	do	do	do	8:20P	10:58P	.492	.82	8:38P	1.27	.646	
*	4-L	.87	2-L	do	do	1.76	do	do	do	do	do	8:20P	11:07P	.656	1.02	8:37P	1.10	.617	
	2-N	2.81	3-N	do	do	1.63	do	do	do	do	do	Estimated--		.012	---	---	1.62	.008	
26			2-L	4:48A	35	.25	1.44	.84	.48	91	64	No	Runoff						
26			2-L	8:45P	---	.07	---	---	---	91	64	do		do					
30-31			2-L	8:35P	393	.87	1.92	.68	.38	95	57	do		do					

* Hydrographs plotted for these storms.

Form

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June

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Form S. C. S.-345

U. S. GOVERNMENT PRINTING OFFICE 8—12368

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH September October, November, 1932.

SHEET 6 OF 7 SHEETS

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Sept. 10*	2-L	1.03	2-L	7:10A	155	1.84	3.15	2.54	1.42	80	63	8:19A	11:06A	.987	1.36	8:29A	.85		
*	3-L	.85	2-L	do	do	1.84	do	do	do	do	do	8:16A	10:36A	.217	.35	9:34A	1.62		
*	4-L	.87	2-L	do	do	1.84	do	do	do	do	do	8:19A	11:20A	.567	1.07	9:34A	1.27		
*	2-N	2.81	3-N	do	do	1.85	do	do	do	do	do	8:44A	11:16A	.067	.23	9:41A	1.78		
*	3-N	2.95	3-N	do	do	1.85	do	do	do	do	do	8:16A	11:42A	.074	.43	9:36A	1.77		
*	1.61AG	1.61	U. S. WEATHER BUREAU			1.64	Standard Gage			do	do	8:22A	10:15A	.157	.92	9:37A	1.48		
10*	2-L	1.03	2-L	5:25P	87	1.36	3.60	1.80	1.73	80	63	5:34P	7:56P	1.184	2.16	6:17P	.18		
*	3-L	.85	2-L	do	do	1.36	do	do	do	do	do	5:31P	7:43P	.917	1.50	6:17P	.44		
*	4-L	.87	2-L	do	do	1.36	do	do	do	do	do	5:31P	7:24P	1.208	2.13	6:15P	.15		
*	2-N	2.81	3-N	do	do	1.36	do	do	do	do	do	5:32P	9:30P	.785	1.62	6:50P	.57		
*	3-N	2.95	3-N	do	do	1.36	do	do	do	do	do	5:31P	8:27P	.193	1.03	6:12P	1.17		
*	1.61AG	1.61	U. S. WEATHER BUREAU			1.46	Standard Gage			do	do	5:37P	7:13P	.735	2.26	6:01P	.72		
11*	2-L	1.03	2-L	12:47A	303	1.58	2.40	1.44	1.12	79	57	12:53A	5:56A	.985	.92	3:57A	.59		
*	3-L	.85	2-L	do	do	1.58	do	do	do	do	do	12:52A	5:28A	.755	.61	4:00A	.82		
*	4-L	.87	2-L	do	do	1.58	do	do	do	do	do	12:52A	4:44A	.515	.49	3:50A	1.06		
*	2-N	2.81	3-N	do	do	1.57	do	do	do	do	do	12:53A	6:55A	.773	1.23	4:15A	.80		
*	3-N	2.95	3-N	do	do	1.57	do	do	do	do	do	12:50A	6:08A	.180	.61	3:27A	1.39		
*	1.61AG	1.61	U. S. WEATHER BUREAU			1.66	Standard Gage			do	do	3:27A	5:15A	.387	.85	4:00A	1.27	.093(a)	
11*	2-L	1.03	2-L	9:43P	14	.25	2.28			79	57	9:56P	10:57P	.107	.32	10:02P	.14	1.365(a)	
*	3-L	.85	2-L	do	do	.25	do			do	do	10:00P	11:09P	.059	.16	10:06P	.19	1.442(a)	
*	4-L	.87	2-L	do	do	.25	do			do	do	10:02P	11:12P	.112	.21	10:14P	.14	5.393(a)	
*	2-N	2.81	3-N	do	do	.30	do			do	do	9:52P	10:45P	.014	.12	9:55P	.29	1.030(a)	
*	3-N	2.95	3-N	do	do	.30	do			do	do	9:54P	10:49P	.014	.23	10:01P	.29	.719(a)	
	1.61AG	1.61	U. S. WEATHER BUREAU			.20	Standard Gage			do	do	No Runoff							
26			2-L	12:16P	293	.09	.24	.20	.12	71	55	No Runoff							
Oct. 4			2-L	---	---	.03	---	---	---	60	42	do		do					
15			2-L	5:20A	15	.08	.48	.32	.16	76	53	do		do					
22			2-L	1:30A	400	1.33	1.56	.76	.50	62	53	do		do					
Nov. 7			U. S. WEATHER BUREAU			.05	Standard Gage			52	35	do		do					

* Hydrographs plotted for these storms. (a) Total losses for storms of September 10-11.

Form 8

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June

July 4

Aug.

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Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH November, December, 19 32

SHEET 7 OF 7 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12368

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Nov. 8			U. S. Weather Bureau			T	Standard Gage			50	25	No Runoff							
15			do	do	do	.06	do		do	33	14	do		do					
17			do	do	do	.01	do		do	32	20	do		do					
Dec. 6			do	do	do	T	do		do	50	24	do		do					
7			do	do	do	T	do		do	26	4	do		do					
8			do	do	do	.10	do		do	16	5	do		do					
9			do	do	do	.02	do		do	5	1	do		do					
10			do	do	do	.03	do		do	9	3	do		do					
11			do	do	do	.03	do		do	7	-9	do		do					
22			do	do	do	T	do		do	48	24	do		do					

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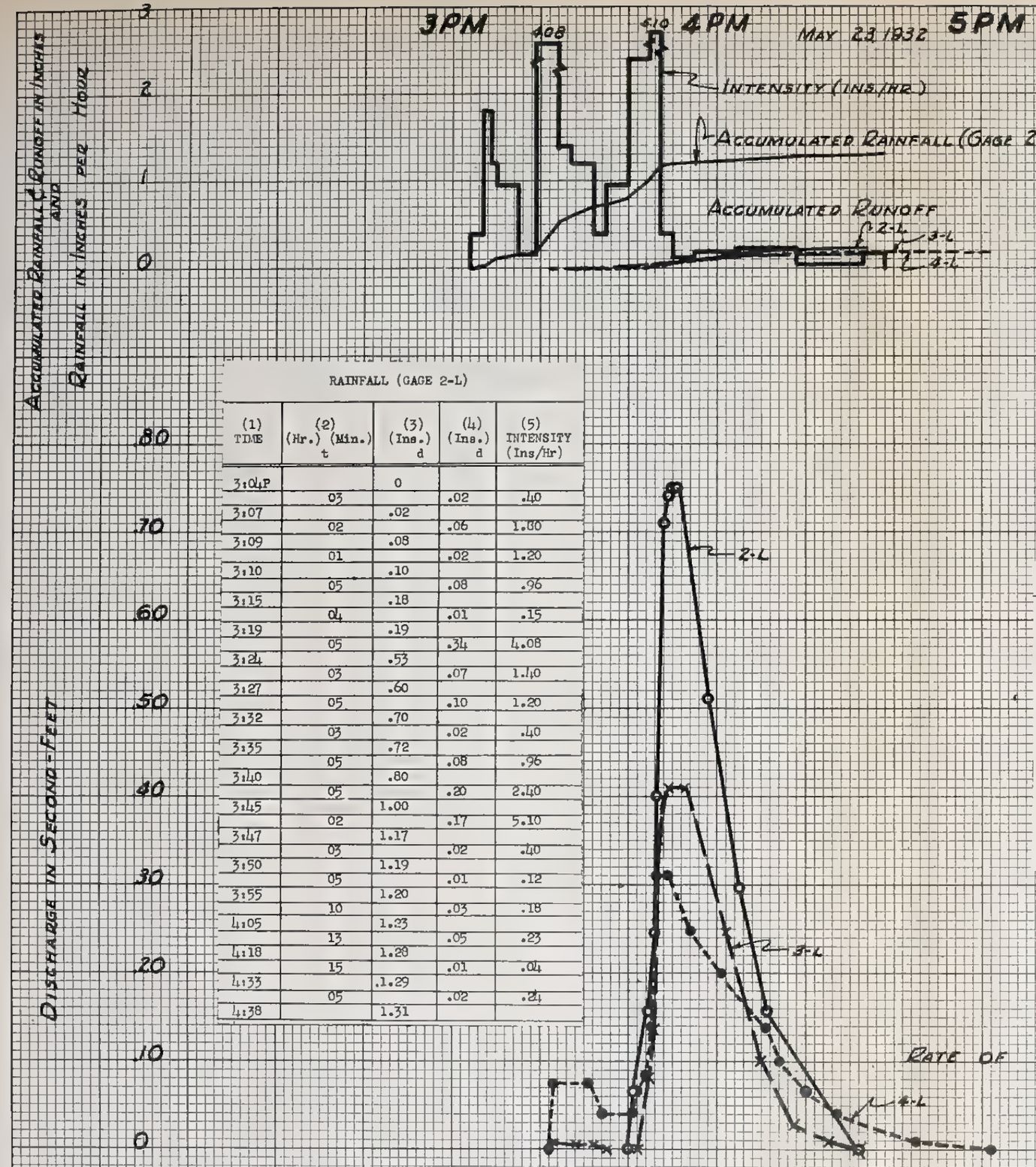
DA

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Sept.

Oct.

Nov.



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
3:04P		0		
	03		.02	.40
3:07		.02		
	02		.06	1.80
3:09		.08		
	01		.02	1.20
3:10		.10		
	05		.08	.96
3:15		.18		
	04		.01	.15
3:19		.19		
	05		.34	4.08
3:24		.53		
	03		.07	1.40
3:27		.60		
	05		.10	1.20
3:32		.70		
	03		.02	.40
3:35		.72		
	05		.08	.96
3:40		.80		
	05		.20	2.40
3:45		1.00		
	02		.17	5.10
3:47		1.17		
	03		.02	.40
3:50		1.19		
	05		.01	.12
3:55		1.20		
	10		.03	.18
4:05		1.23		
	13		.05	.23
4:18		1.28		
	15		.01	.04
4:33		.1.29		
	05		.02	.21
4:38		1.31		

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.0	.37	.07
date began	5/15	5/15	5/15
duration (hours)	1.37	1.37	1.37
Temperature (max & min.)	87 & 60	87 & 60	87 & 60
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	*	Wheat	Barley
height (ft.)		.9	.1 to .2
date last cultivated	5/17/32	10/15/31	4/2/32
Soil loss (tons per acre)	.252	.183	1.250
Remarks	*Lister ridges were curled in by ridge buster.		

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF
HAYS, KANSAS

STORM NO. ..... May 23, 1932

Plot by LAM date 11-38 checked by DRD & LAM 12-12-38
Computations by LAM date 11-38 checked by LAM & DRD 12-12-38

Sheet 1 of 2 sheets

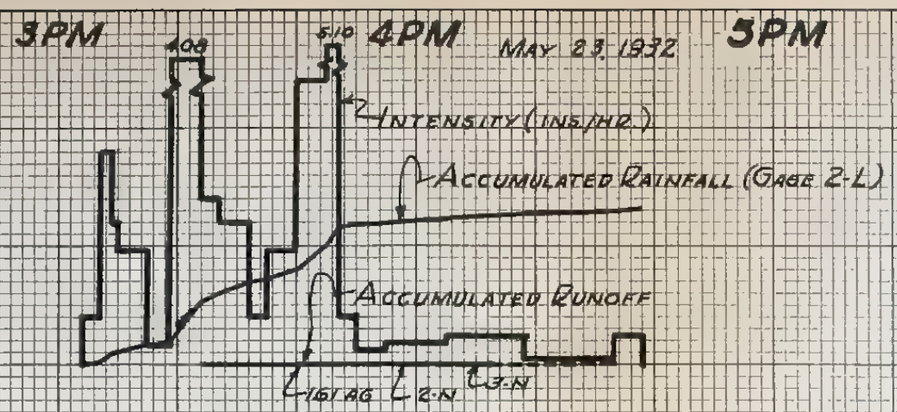
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PROJ

D

Nov.

Dec.



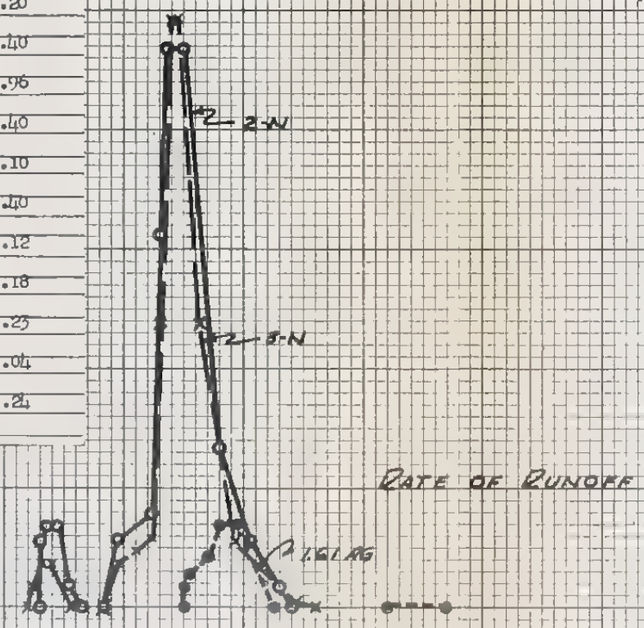
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

3 2 1 0 .30 .20 .10 0

RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
3:04P		0		
	03		.02	.40
3:07		.02		
	02		.06	1.80
3:09		.08		
	01		.02	1.20
3:10		.10		
	05		.08	.96
3:15		.18		
	04		.01	.15
3:19		.19		
	05		.34	4.08
3:24		.53		
	03		.07	1.40
3:27		.60		
	05		.10	1.20
3:32		.70		
	03		.02	.40
3:35		.72		
	05		.08	.96
3:40		.80		
	05		.20	2.40
3:45		1.00		
	02		.17	5.10
3:47		1.17		
	03		.02	.40
3:50		1.19		
	05		.01	.12
3:55		1.20		
	10		.03	.18
4:05		1.23		
	13		.05	.23
4:18		1.28		
	15		.01	.04
4:33		1.29		
	05		.02	.24
4:38		1.31		

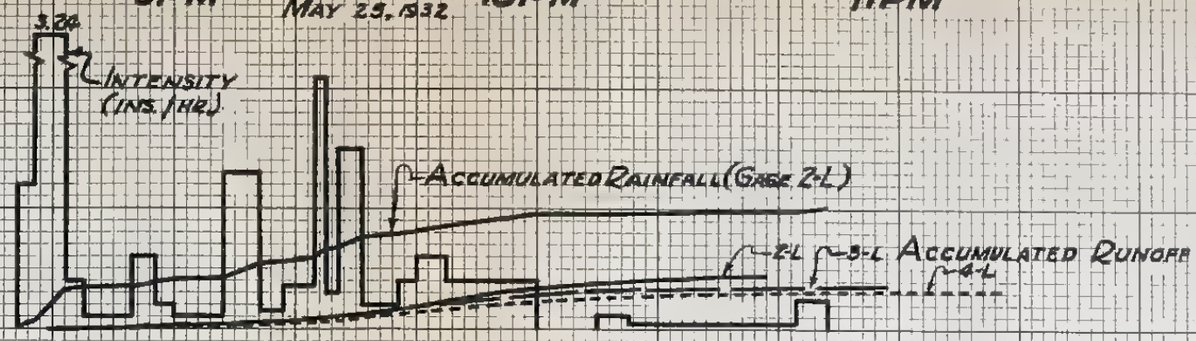


Watershed	2-N	3-N	1.61 AG
Area (acres)	2.81	2.95	1.61
Preceding Rain (in.)	.07	.07	.12
date began	5/15	5/15	5/15
duration (hours)	1.37*	1.37*	1.37*
Temperature (max. & min.)	87 & 60	87 & 60	87 & 60
Soil (major type)	Colby Silt Clay Loam		
percent of area	90	90	85
Slope, average (percent)	3-7	3-7	5-8
maximum	7	7	8
Cover, type	Wheat	Wheat	**
height ft.	.9	.9	.3
date last cultivated	10/15/31	10/15/31	
Soil loss (tons per acre)	None	None	***
Remarks			

* Record taken from 2-L recording rain gage, believed to be about the same.
** Native buffalo grass.
*** No soil loss record prior to August 1, 1932.

HAYS, KANSAS
May 23, 1932
Sheet 2 of 2 sheets

8PM 9PM MAY 25, 1932 10PM 11PM



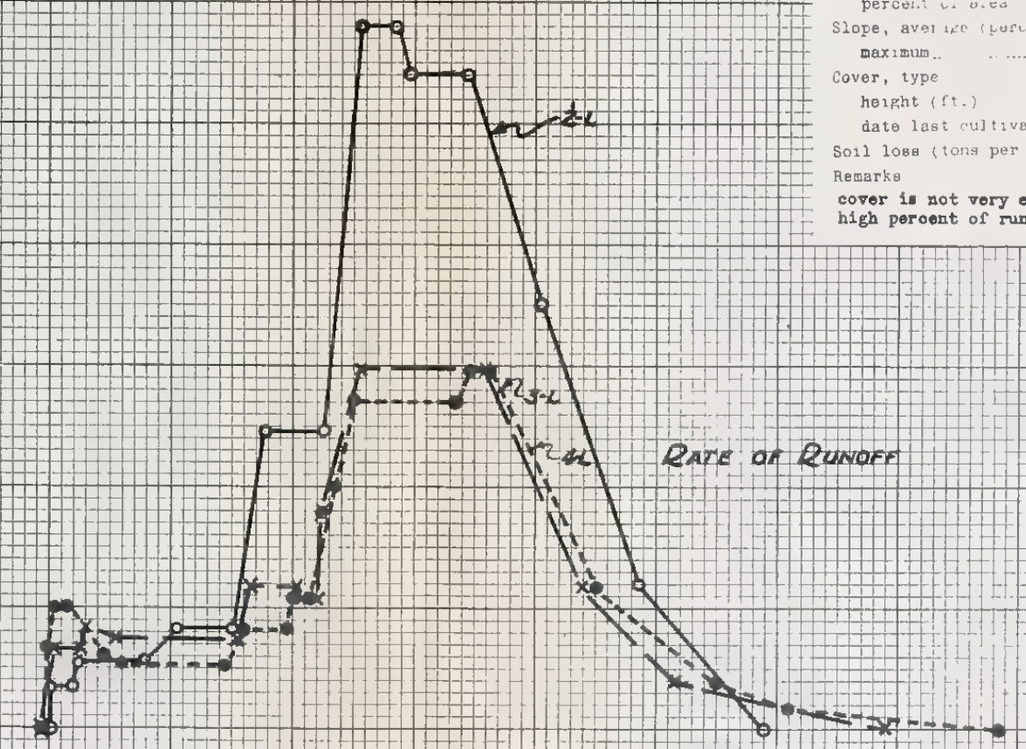
ACCUMULATED RAINFALL AND RUNOFF IN INCHES

RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
8:34P		0		
	03		.06	1.20
8:37		.06		
	05		.27	3.24
8:42		.33		
	03		.02	.40
8:45		.35		
	08		.01	.10
8:53		.36		
	04		.04	.60
8:57		.40		
	03		.01	.20
9:00		.41		
	08		.01	.10
9:08		.42		
	06		.13	1.30
9:14		.55		
	04		.01	.15
9:18		.56		
	05		.03	.36
9:23		.59		
	02		.07	2.10
9:25		.66		
	02		.01	.30
9:27		.67		
	04	.	.10	1.50
9:31		.77		
	06		.02	.20
9:37		.79		
	03		.02	.40
9:40		.81		
	05		.05	.60
9:45		.86		
	15		.10	.40
10:00		.96		
	10		0	0
10:10		.96		
	05		.01	.12
10:15		.97		
	28		.02	.04
10:43		.99		
	05		.02	.24
10:48		1.01		



Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	1.31	1.31	1.31
date began	5/23	5/23	5/23
duration (hours)	1.57	1.57	1.57
Temperature (max. & min.)	82 & 58	82 & 58	82 & 58
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	None, ridges	Wheat	Barley
height (ft.)	curled in	.9	.1 to .2
date last cultivated	5/17	10/15/31	4/2/32
Soil loss (tons per acre)	.195	.281	.212

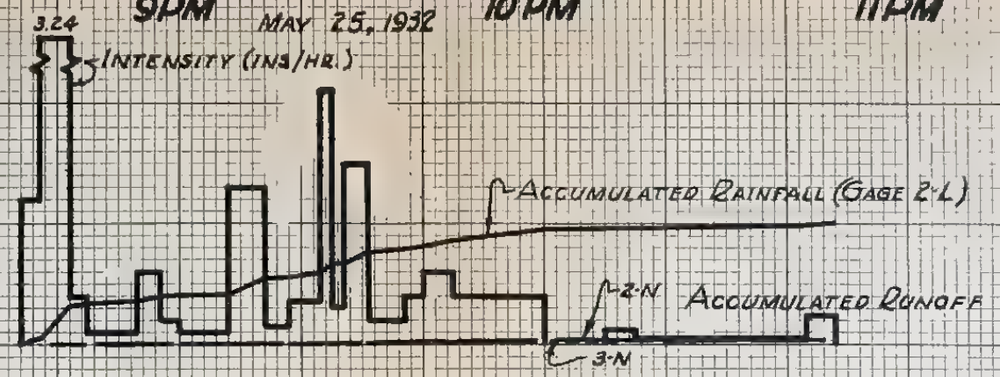
Remarks: Wheat is growing rapidly. Barley cover is not very effective. Rainfall of May 23 is responsible for the high percent of runoff.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF.
HAYS, KANSAS

STORM NO May 25, 1932

Plot by Sam date 11 39 checked by JRDotyn date 12/15/39.
Computations by Sam. date 11 39 Sam 12-15-39
JRD

Sheet 1 of 2 sheets

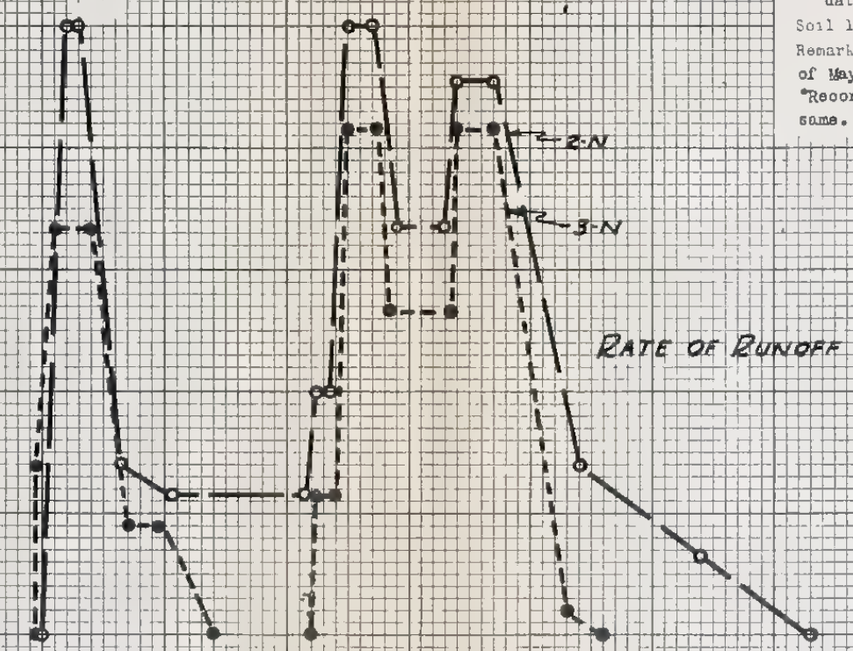


ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
8:34P		0		
	03		.06	1.20
8:37		.06		
	05		.27	3.24
8:42		.33		
	03		.02	.40
8:45		.35		
	08		.01	.10
8:53		.36		
	04		.04	.60
8:57		.40		
	03		.01	.20
9:00		.41		
	08		.01	.10
9:08		.42		
	06		.13	1.30
9:14		.55		
	04		.01	.15
9:18		.56		
	05		.03	.36
9:23		.59		
	02		.07	2.10
9:25		.66		
	02		.01	.30
9:27		.67		
	04		.10	1.50
9:31		.77		
	06		.02	.20
9:37		.79		
	03		.02	.40
9:40		.81		
	05		.05	.60
9:45		.86		
	15		.10	.40
10:00		.96		
	10		0	0
10:10		.96		
	05		.01	.12
10:15		.97		
	28		.02	.04
10:43		.99		
	05		.02	.24
10:48		1.01		



Watershed	2-N	3-N
Area (acres)	2.81	2.95
Preceding Rain (in.)	1.35	1.35
date began	5/23	5/23
duration (hrs.)	1.57*	1.57*
Temperature (max. & min.)	82 & 58	82 & 58
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	Wheat	Wheat
height (ft.)	.9	.9
date last cultivated	10/15/31	10/15/31
Soil loss (tons per acre)	.015	.024

Remarks: Wheat is growing rapidly. Rainfall of May 25 is responsible for the high percent of runoff.

*Record taken from 2-L recording rain gage, believe to be about the same.

HAYS, KANSAS

May 25, 1932

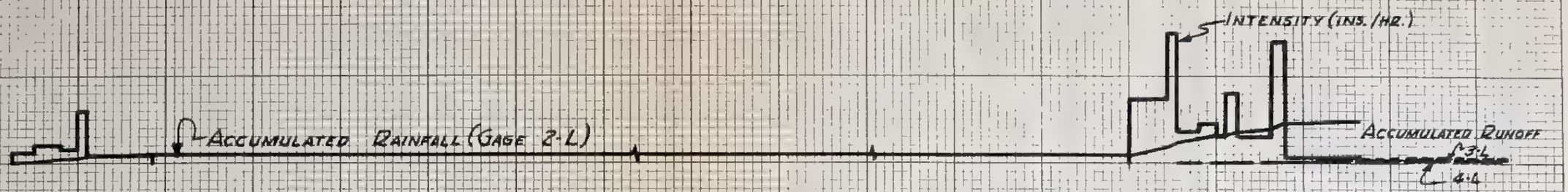
Sheet 2 of 2 sheets

ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

3 2 1 0 .08 .07 .06 .05 .04 .03 .02 .01 0

1AM 2AM JUNE 5, 1932 5AM 6AM 7AM

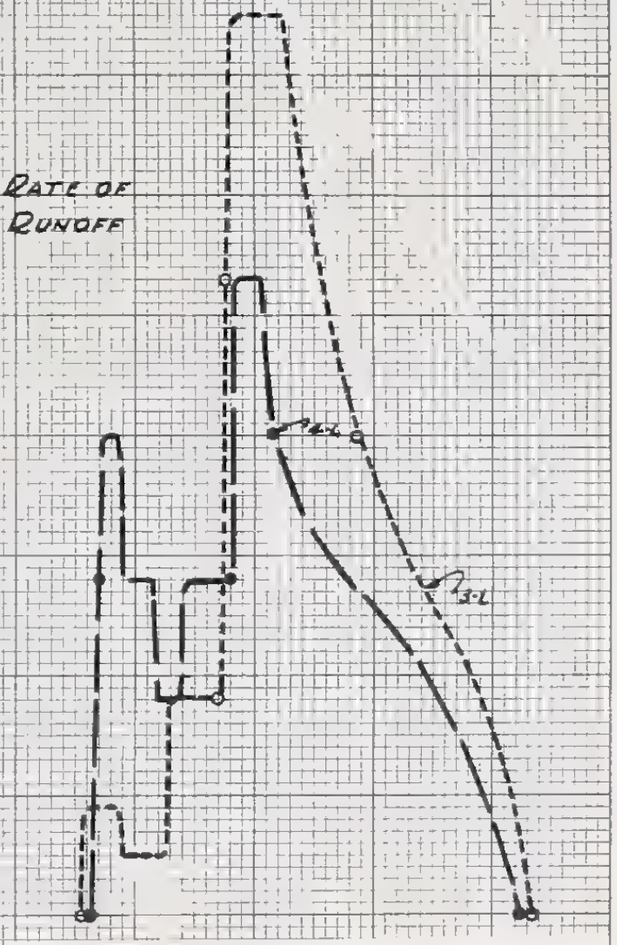


RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
12:45A		0		
	05		.01	.12
12:50		.01		
	06		.02	.20
12:56		.03		
	04		.01	.15
1:00		.04		
	02		.02	.60
1:02		.06		
	15		.02	.08
1:17		.08		
	4 23		.0	.0
5:40		.03		
	09		.11	.73
5:49		.19		
	02		.05	1.50
5:51		.24		
	05		.03	.36
5:56		.27		
	04		.03	.45
6:00		.30		
	02		.01	.30
6:02		.31		
	03		.04	.80
6:05		.35		
	08		.04	.30
6:13		.39		
	03		.07	1.40
6:16		.46		
	17		.02	.07
6:33		.48		

Watershed	3-L	4-L
Area (acres)	.85	.87
Preceding Rain (in.)	.29	.28
date began	6/4	6/4
duration (hours)	1.03	1.08
Temperature (max. & min.)	76 & 60	76 & 60
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	100
Slope, average (per cent)	5-7	6-8
maximum	7	8
Cover, type	Wheat	Barley
height (ft.)	1.0	1.0
date last cultivated	10/15/31	4/2/32
Soil loss (tons per acre)	*	*
Remarks	*Included in soil loss for June 8.	

RATE OF RUNOFF



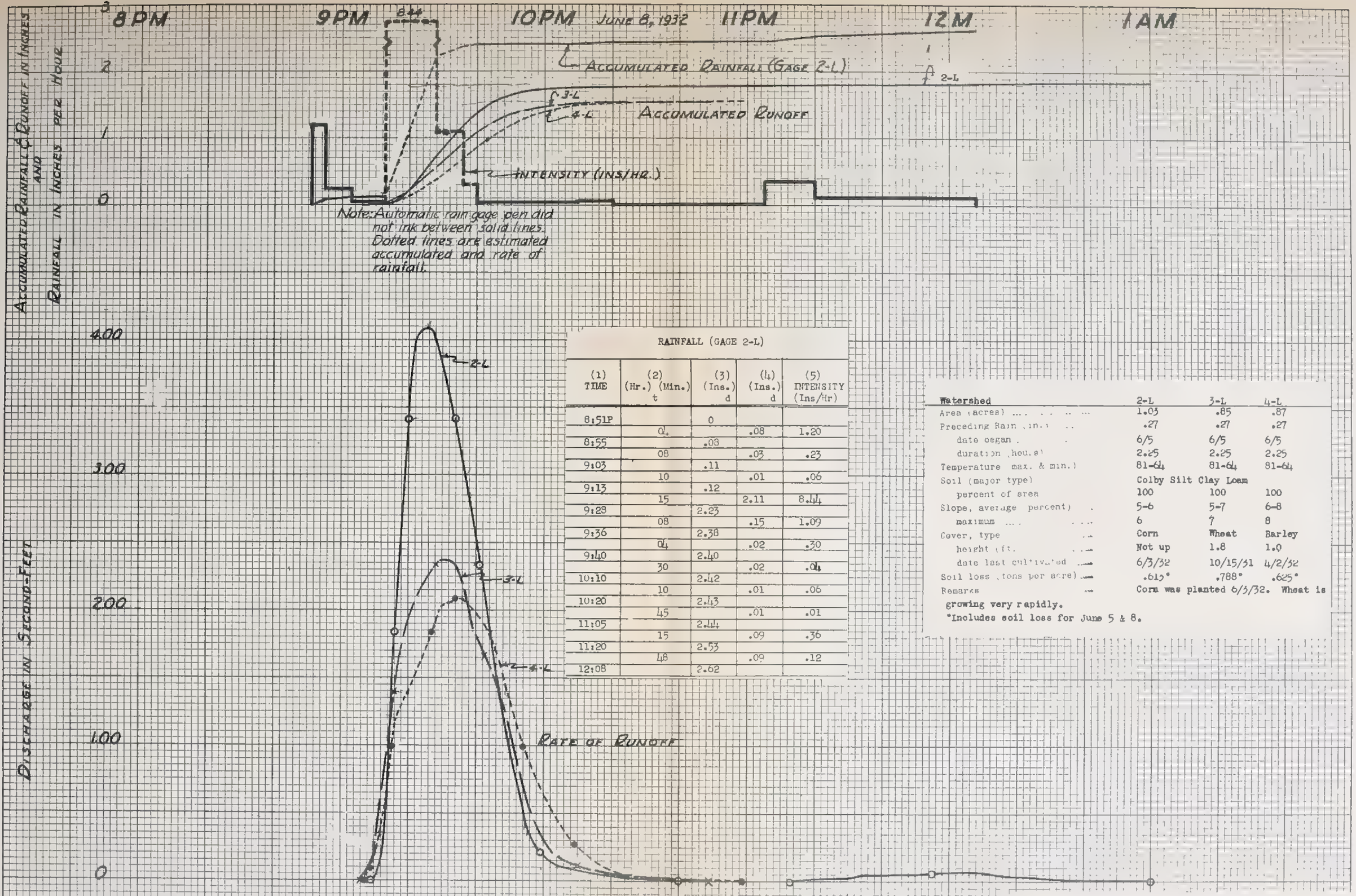
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF.
HAYS, KANSAS

STORM NO .... June 5, 1932

Plot by ... date 12-15-32 checked by ... 12-15-32

Computed by ... 12-15-32

Sheet 1 of 1 sheet



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
8:51P		0		
	04		.08	1.20
8:55		.08		
	08		.03	.23
9:03		.11		
	10		.01	.06
9:13		.12		
	15		2.11	8.44
9:28		2.23		
	08		.15	1.09
9:36		2.38		
	04		.02	.30
9:40		2.40		
	30		.02	.04
10:10		2.42		
	10		.01	.06
10:20		2.43		
	45		.01	.01
11:05		2.44		
	15		.09	.36
11:20		2.53		
	48		.09	.12
12:08		2.62		

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.27	.27	.27
date began	6/5	6/5	6/5
duration (hours)	2.25	2.25	2.25
Temperature (max. & min.)	81-64	81-64	81-64
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	Wheat	Barley
height (ft.	Not up	1.8	1.0
date last cultivated	6/3/32	10/15/31	4/2/32
Soil loss (tons per acre)	.613*	.788*	.625*
Remarks	Corn was planted 6/3/32. Wheat is growing very rapidly.		

*Includes soil loss for June 5 & 8.

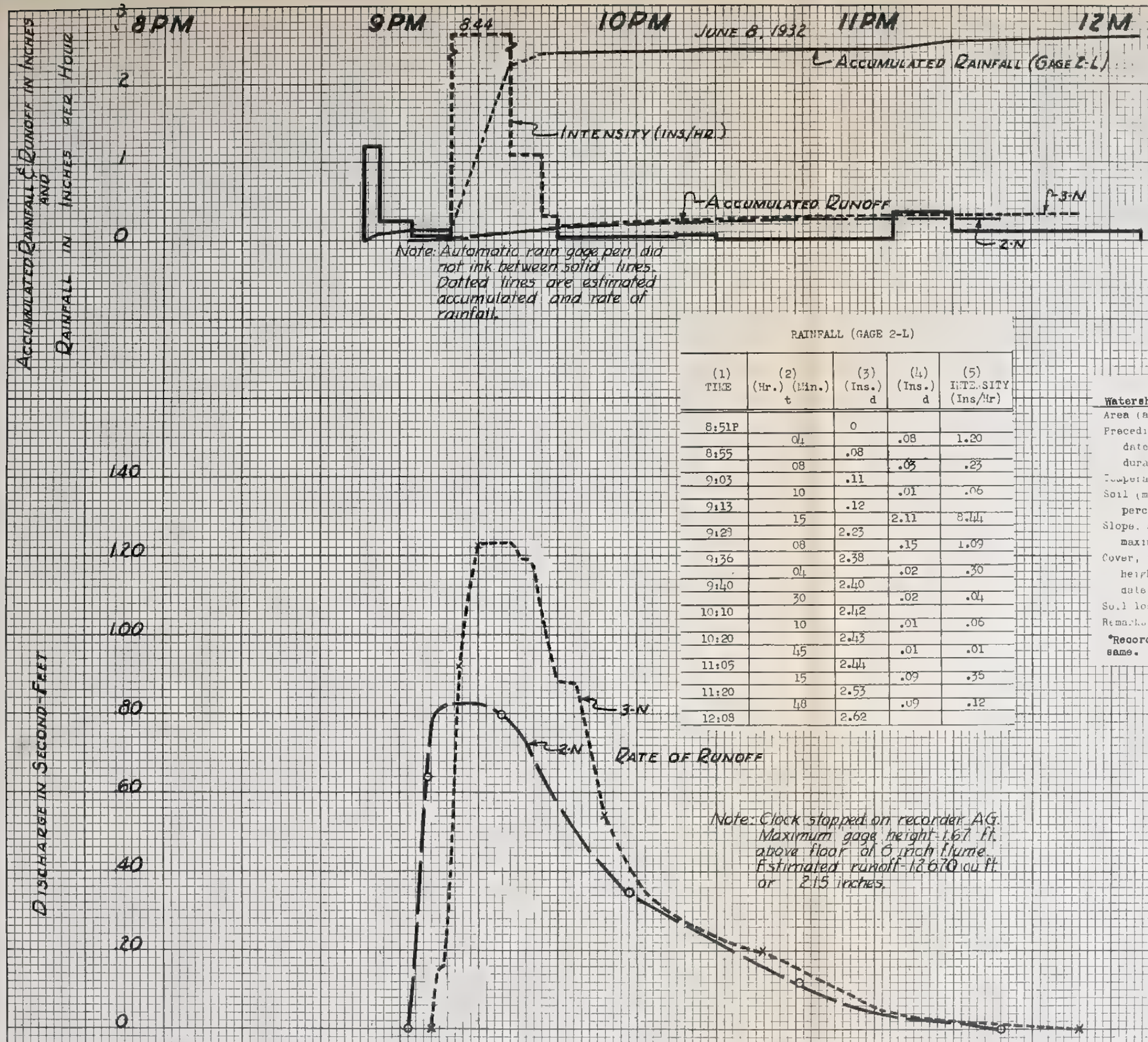
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF
HAYS, KANSAS

STORM NO . . June 8, 1932

Plot by ... date 11-39 Checked by ... date 12-15-32

Computed by ... 11-39 ... date 12-15-32

Sheet 1 of 2 sheets



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
8:51P		0		
	04		.08	1.20
8:55		.08		
	08		.03	.23
9:03		.11		
	10		.01	.06
9:13		.12		
	15		2.11	8.44
9:28		2.23		
	08		.15	1.09
9:36		2.38		
	04		.02	.30
9:40		2.40		
	30		.02	.04
10:10		2.42		
	10		.01	.06
10:20		2.43		
	45		.01	.01
11:05		2.44		
	15		.09	.35
11:20		2.53		
	48		.09	.12
12:08		2.62		

Watershed	2-N	3-N
Area (acres)	2.81	2.95
Preceding Rain (in.)	.27	.27
date began	6/5	6/5
duration (hours	2.25*	2.25*
Temperature (max. & min.)	81-64	81-64
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	Wheat	Wheat
height (ft.	1.8	1.8
date last cultivated	10/15/31	10/15/31
Soil loss (tons per acre)	.165	.083
Remarks	Wheat is growing very rapidly.	

*Record taken from 2-L recording rain gage, believed to be about the same.

HAYS, KANSAS

June 8, 1932

Sheet 2 of 2 sheets

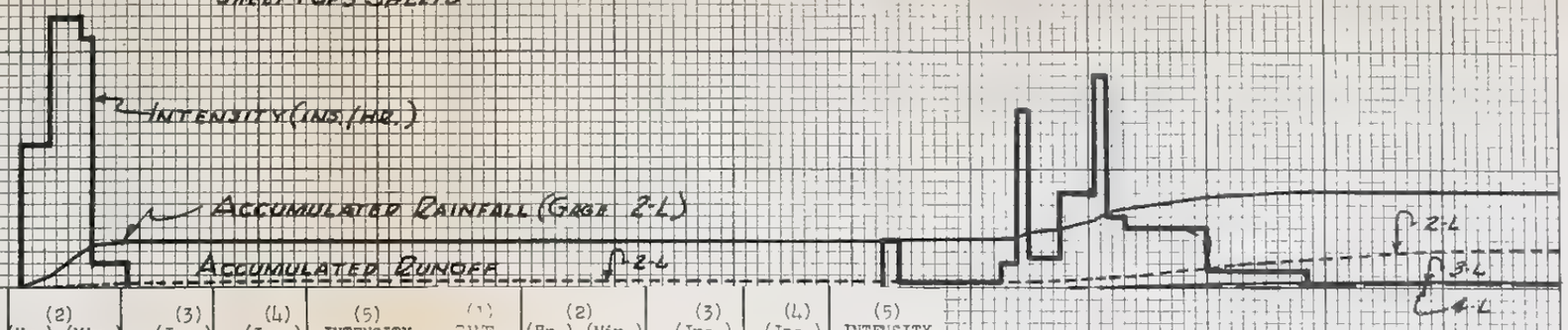
7PM 8PM JUNE 18, 1932 9PM 10PM 11PM

SHEET 1 OF 3 SHEETS

ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

3
2
1
0
40
30
20
10
0

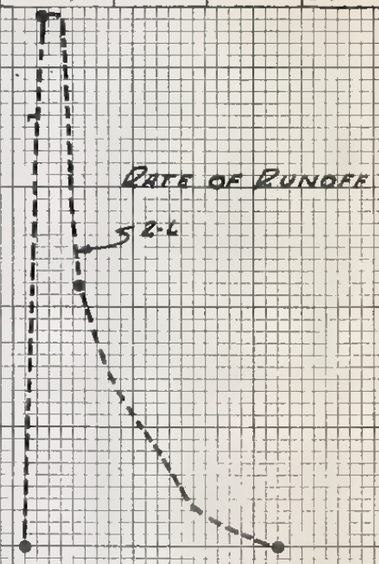


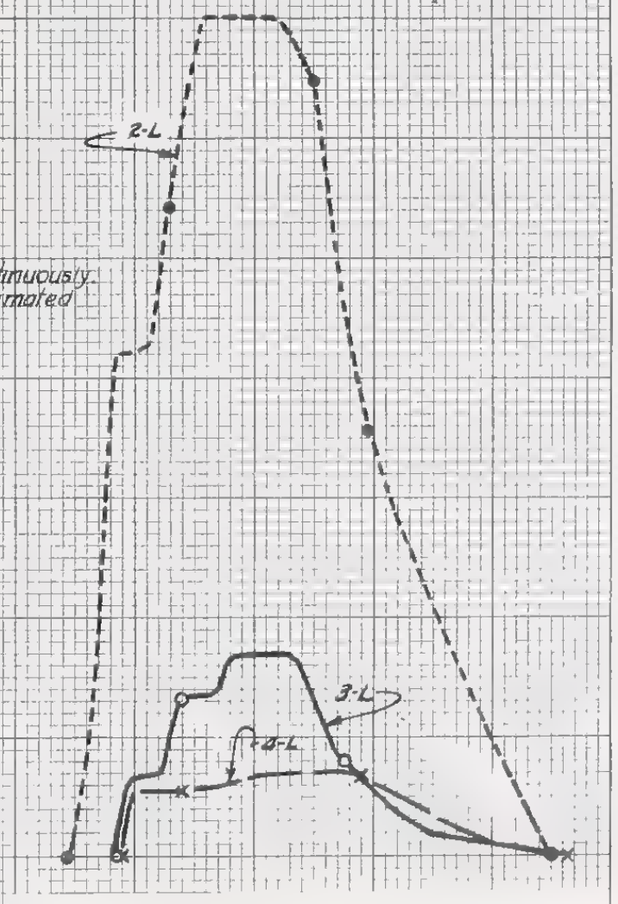
(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
7:40P		0		
	05		.10	1.20
7:45		.10		
	05		.19	2.28
7:50		.29		
	02		.07	2.10
7:52		.36		
	06		.02	.20
7:58		.38		
	2 07		.0	.0
10:05		.38		
	03		.02	.40
10:08		.40		
	17		.01	.04
10:25		.41		
	03		.01	.20
10:28		.42		
	02		.05	1.50
10:30		.47		
	05		.02	.24
10:35		.49		
	06		.08	.80
10:41		.57		
	02		.06	1.30
10:43		.63		
	03		.03	.60
10:46		.66		
	14		.12	.52

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
11:00P		.78		
	17		.04	.14
11:17		.82		
	1 48		.0	.0
1:05A		.82		
	12		.01	.05
1:17		.83		
	13		.0	.0
1:30		.83		
	05		.08	.96
1:35		.91		
	05		.03	.36
1:40		.94		
	35		.04	.07
2:15		.98		
	10		.04	.24
2:25		1.02		
	37		.0	.0
3:02		1.02		
	05		.05	.60
3:07		1.07		
	16		.01	.04
3:23		1.08		
	06		.02	.20
3:29		1.10		
	18		.04	.14
3:47		1.14		
	05		.11	1.32

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
3:52A		1.25		
	04		.03	.45
3:56		1.28		
	04		.02	.30
4:00		1.30		
	50		.0	.0
4:50		1.30		
	05		.02	.24
4:55		1.32		
	10		.0	.0
5:05		1.32		
	03		.02	.40
5:08		1.34		
	1 07		.0	.0
6:15		1.34		
	2 00		.04	.02
8:15		1.38		
	2 30		.0	.0
10:45		1.38		
	05		.06	.72
10:50		1.44		
	05		.05	.60
10:55		1.49		
	20		.02	.06
11:15		1.51		

Pen did not ink continuously. Parts of curve estimated by observer.





UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF.
HAYS, KANSAS

STORM NO. ... June 18-19, 1932

Plot by Lidu date 11-39 ... d. Rdd Jam 12-13-39

Computations by Jam. " 11 39 ... Rdd Jam 12-13 39

Sheet 1 of 3 sheets

12M 1AM 2AM 3AM 4AM 5AM

JUNE 19 1932
SHEET 2 OF 3 SHEETS

ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

3
2
1
0
.40
.30
20
10
0

ACCUMULATED RAINFALL (GAGE 2-L)

ACCUMULATED RUNOFF

INTENSITY (INS./HR.)

$I_{2\text{-}L}$

$I_{3\text{-}L}$

$I_{4\text{-}L}$

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	T	T	T
date began	6/16	6/16	6/16
duration (hours)			
Temperature (max. & min.)	88-59	88-59	88-59
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	Wheat	Barley
height (ft.)	.6	2.1	1.3 to 1.8
date last cultivated	6/3/32	10/15/31	4/2/32
Soil loss (tons per acre)	*	*	*
Remarks			

*Includes soil loss for June 18, 19, 25 and 26, and recorded June 26.

$I_{2\text{-}L}$

2-L

RATE OF RUNOFF

$I_{4\text{-}L}$

3-L

HAYS, KANSAS

June 18-19, 1932

Sheet 2 of 3 sheets

JUNE 19, 1932
SHEET 3 OF 3 SHEETS

6AM 7AM 8AM 9AM 10AM 11AM

ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

3
2
1
0

ACCUMULATED RAINFALL (GAGE 2-L)

ACCUMULATED RUNOFF

INTENSITY (INS./HR.)

2-L
3-L
4L

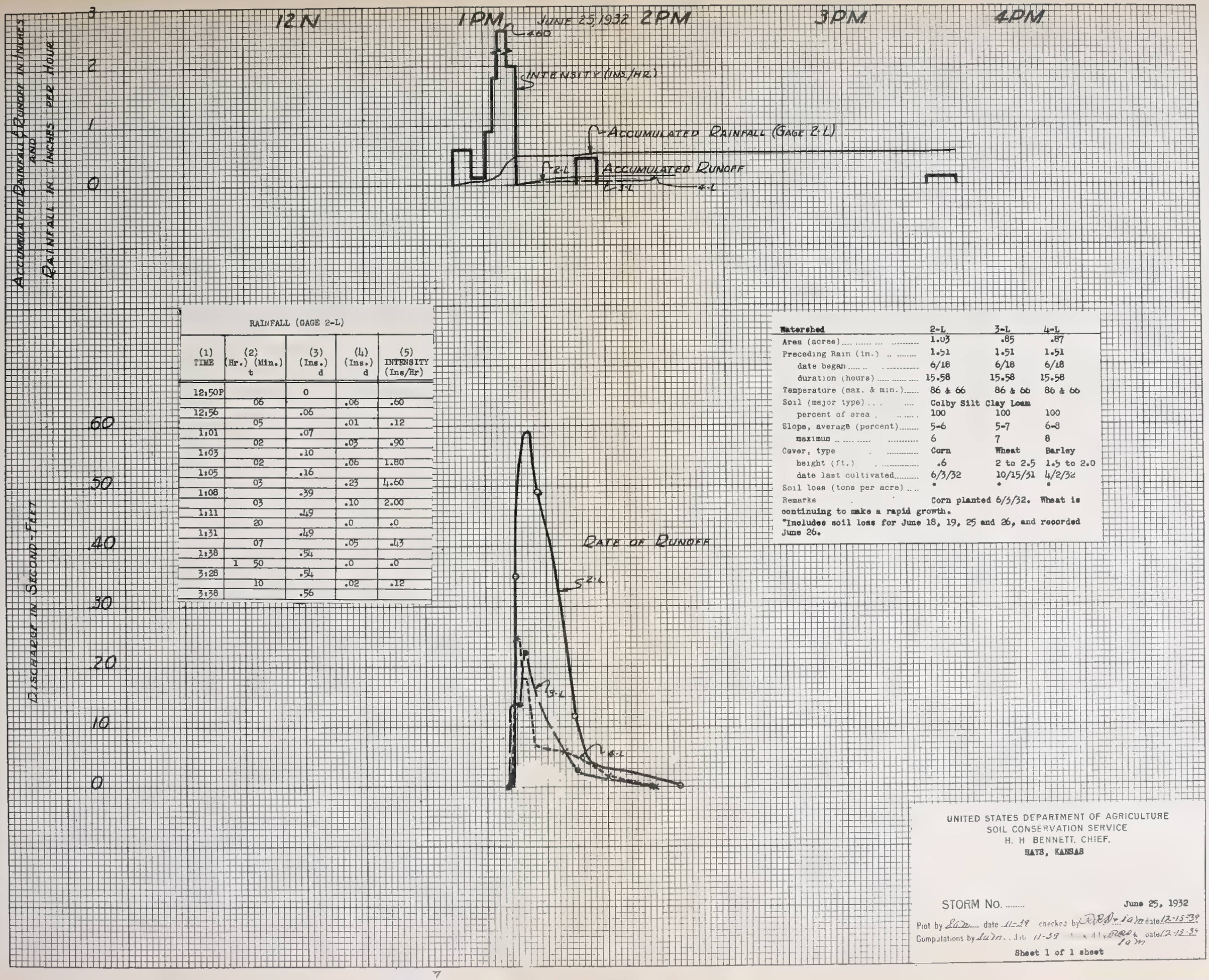
40
30
20
10
0

DISCHARGE IN SECOND-FEET

RATE OF RUNOFF

2-L
4-L
3-L

BATT, KANSAS
June 19-32, 1932
Sheet 3 of 3 sheets



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) t	(2) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
12:50P			0		
		06		.06	.60
12:56			.06		
		05		.01	.12
1:01			.07		
		02		.03	.90
1:03			.10		
		02		.06	1.80
1:05			.16		
		03		.23	4.60
1:08			.39		
		03		.10	2.00
1:11			.49		
		20		.0	.0
1:31			.49		
		07		.05	.43
1:38			.54		
	1	50		.0	.0
3:28			.54		
		10		.02	.12
3:38			.56		

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	1.51	1.51	1.51
date began	6/18	6/18	6/18
duration (hours)	15.58	15.58	15.58
Temperature (max. & min.)	86 & 66	86 & 66	86 & 66
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	Wheat	Barley
height (ft.)	.6	2 to 2.5	1.5 to 2.0
date last cultivated	6/3/32	10/15/31	4/2/32
Soil loss (tons per acre)	*	*	*
Remarks	Corn planted 6/3/32. Wheat is continuing to make a rapid growth.		

*Includes soil loss for June 18, 19, 25 and 26, and recorded June 26.

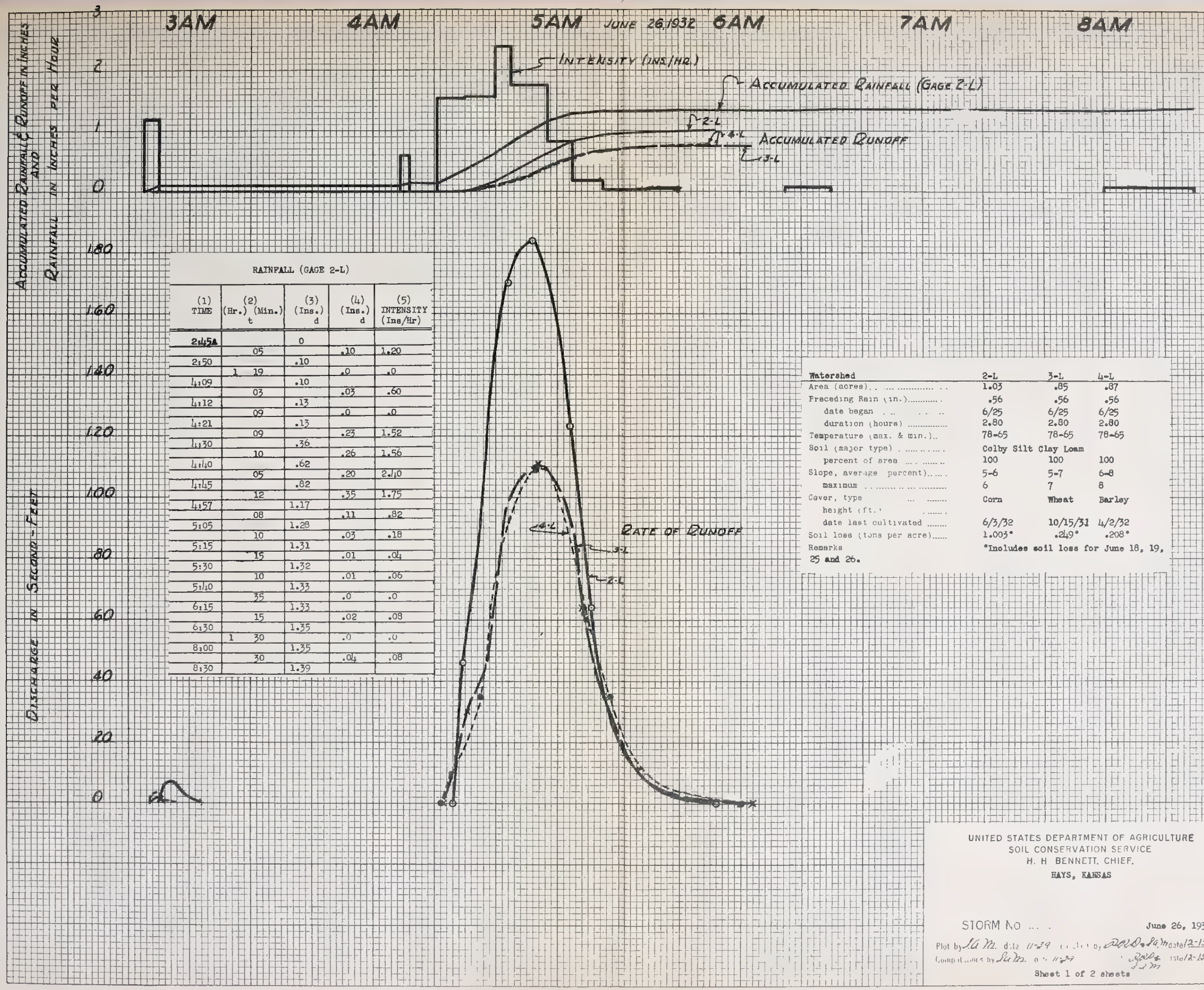
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H BENNETT, CHIEF.
HAYS, KANSAS

STORM NO. ..... June 25, 1932

Plot by Lda date 11-39 checked by RRB-Jam date 12-15-39

Computations by Lda date 11-39 checked by RRB & Jam date 12-15-39

Sheet 1 of 1 sheet



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
2:45A		0		
	05		.10	1.20
2:50		.10		
	1 19		.0	.0
4:09		.10		
	03		.03	.60
4:12		.13		
	09		.0	.0
4:21		.13		
	09		.23	1.52
4:30		.36		
	10		.26	1.56
4:40		.62		
	05		.20	2.40
4:45		.82		
	12		.35	1.75
4:57		1.17		
	08		.11	.82
5:05		1.28		
	10		.03	.18
5:15		1.31		
	15		.01	.04
5:30		1.32		
	10		.01	.06
5:40		1.33		
	35		.0	.0
6:15		1.33		
	15		.02	.08
6:30		1.35		
	1 30		.0	.0
8:00		1.35		
	30		.04	.08
8:30		1.39		

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.56	.56	.56
date began	6/25	6/25	6/25
duration (hours)	2.80	2.80	2.80
Temperature (max. & min.)	78-65	78-65	78-65
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	Wheat	Barley
height (ft.)			
date last cultivated	6/3/32	10/15/31	4/2/32
Soil loss (tons per acre)	1.003*	.249*	.208*
Remarks	*Includes soil loss for June 18, 19, 25 and 26.		

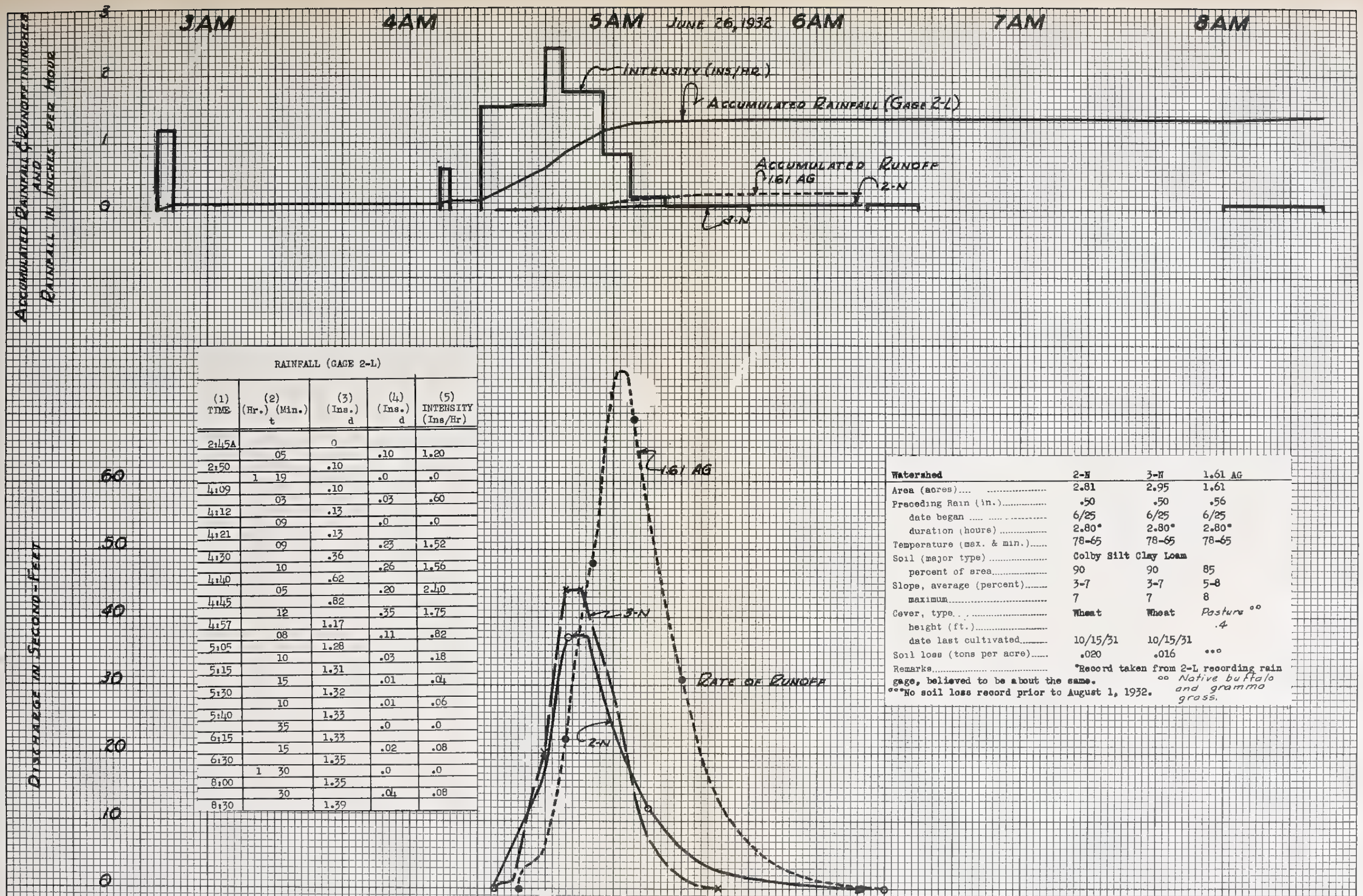
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H BENNETT, CHIEF.
HAYS, KANSAS

STORM No ... . June 26, 1932

Plot by S.A.M. date 11-39 Checked by A.R.D. & S.A.M. date 12-15 39

Computations by S.A.M. date 11-39 Checked by A.R.D. & S.A.M. date 12-15 39

Sheet 1 of 2 sheets



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
2:45A		0		
	05		.10	1.20
2:50		.10		
	1 19		.0	.0
4:09		.10		
	03		.03	.60
4:12		.13		
	09		.0	.0
4:21		.13		
	09		.23	1.52
4:30		.36		
	10		.26	1.56
4:40		.62		
	05		.20	2.40
4:45		.82		
	12		.35	1.75
4:57		1.17		
	08		.11	.82
5:05		1.28		
	10		.03	.18
5:15		1.31		
	15		.01	.04
5:30		1.32		
	10		.01	.06
5:40		1.33		
	35		.0	.0
6:15		1.33		
	15		.02	.08
6:30		1.35		
	1 30		.0	.0
8:00		1.35		
	30		.04	.08
8:30		1.39		

Watershed	2-N	3-N	1.61 AG
Area (acres)	2.81	2.95	1.61
Preceding Rain (in.)	.50	.50	.56
date began	6/25	6/25	6/25
duration (hours)	2.80*	2.80*	2.80*
Temperature (max. & min.)	78-65	78-65	78-65
Soil (major type)	Colby Silt Clay Loam		
percent of area	90	90	85
Slope, average (percent)	3-7	3-7	5-8
maximum	7	7	8
Cover, type	Wheat	Wheat	Pasture °°
height (ft.)			.4
date last cultivated	10/15/31	10/15/31	
Soil loss (tons per acre)	.020	.016	°°°

Remarks

*Record taken from 2-L recording rain gage, believed to be about the same.

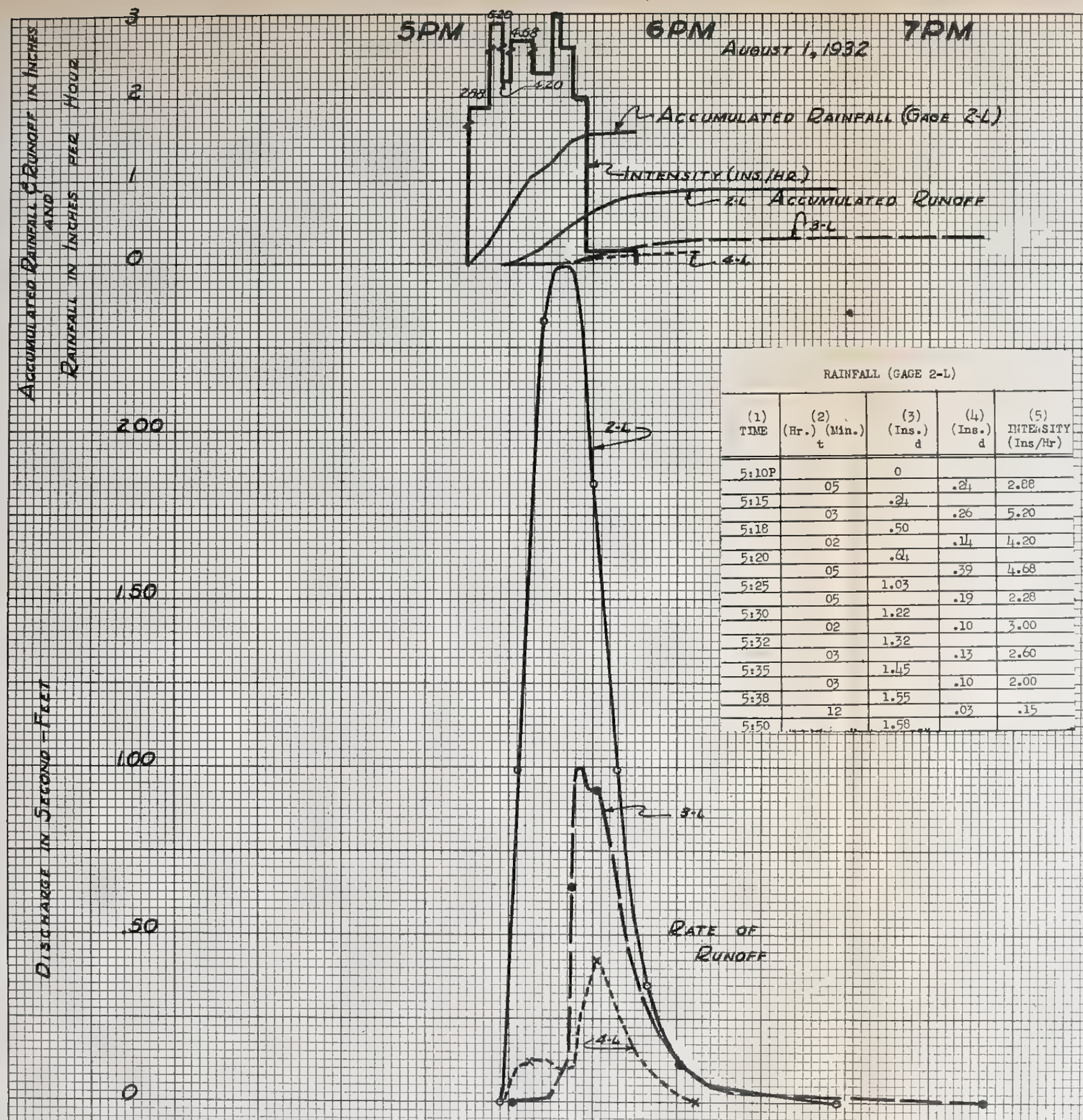
°°Native buffalo and grammo grass.

°°°No soil loss record prior to August 1, 1932.

HAYS, KANSAS

June 26, 1932

Sheet 2 of 2 sheets



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
5:10P		0		
	05		.24	2.88
5:15		.24		
	03		.26	5.20
5:18		.50		
	02		.14	4.20
5:20		.64		
	05		.39	4.68
5:25		1.03		
	05		.19	2.28
5:30		1.22		
	02		.10	3.00
5:32		1.32		
	03		.13	2.60
5:35		1.45		
	03		.10	2.00
5:38		1.55		
	12		.03	.15
5:50		1.58		

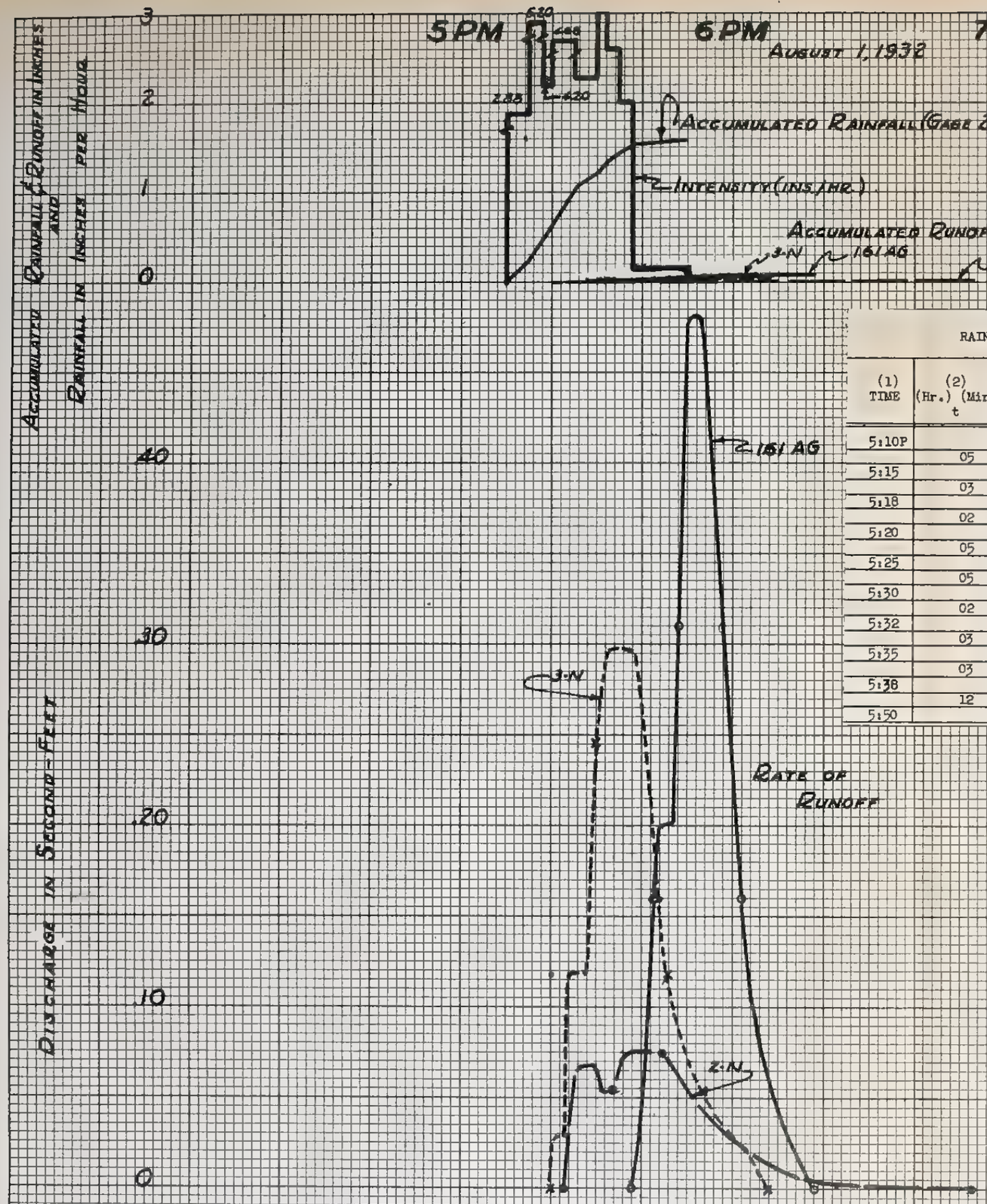
Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.45	.45	.45
date began	7/30	7/30	7/30
duration (hours)	.42	.42	.42
Temperature (max. & min.)	96-71	96-71	96-71
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	Listed*	Plowed**
height (ft.)	2.0		
date last cultivated	6/29/32	7/21/32	7/16/32
Soil loss (tons per acre)	1.147	.205	.205

Remarks: *Wheat stubble was listed 6" deep in 42" rows.
**Land plowed with moldboard plow 6" deep.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF.
HAYS, KANSAS

STORM NO. ..... August 1, 1932

Plot by S.A.M. date 11-29 checked by R.R.D. + S.A.M. date 12-15-39
Computations by S.A.M. date 11-29 checked by S.A.M. + date 12-15-39
Sheet 1 of 2 sheets



RAINFALL (GAGE 2-L)

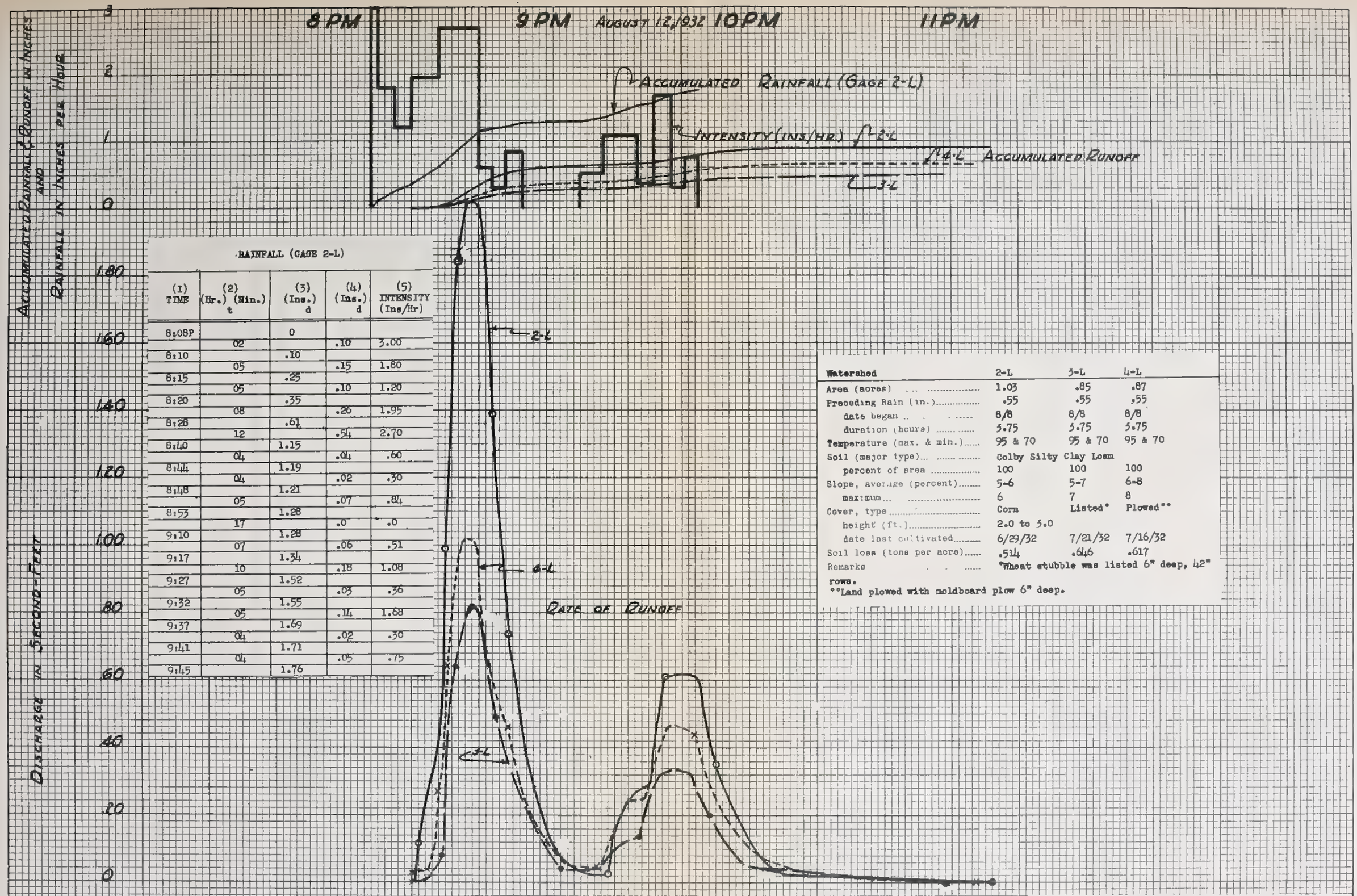
(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
5:10P		0		
	05		.24	2.88
5:15		.24		
	03		.26	5.20
5:18		.50		
	02		.14	4.20
5:20		.64		
	05		.39	4.68
5:25		1.03		
	05		.19	2.28
5:30		1.22		
	02		.10	3.00
5:32		1.32		
	03		.13	2.60
5:35		1.45		
	03		.10	2.00
5:38		1.55		
	12		.03	.15
5:50		1.58		

Watershed	2-N	3-N	1.61 AG
Area (acres)	2.81	2.95	1.61
Preceding Rain (in.)	.34	.34	.43
date began	7/30	7/30	7/30
duration (hours)	.42*	.42*	.42*
Temperature (max. & min.)	96-71	96-71	96-71
Soil (major type)	Colby Silt Clay Loam		
percent of area	90	90	85
Slope, average (percent)	3-7	3-7	5-8
maximum	7	7	8
Cover, type	***	***	**Pasture
height (ft.)			About .4
date last cultivated	7/18/32	7/18/32	
Soil loss (tons per acre)	.016	.042	.005
Remarks	*Record taken from 2-L recording rain gage, believed to be about the same. **Native buffalo and grama grass. ***One way disked and subsoil packed.		

HAYS, KANSAS

August 1, 1932

Sheet 2 of 2 sheets



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
8:08P		0		
	02		.10	3.00
8:10		.10		
	05		.15	1.80
8:15		.25		
	05		.10	1.20
8:20		.35		
	08		.26	1.95
8:28		.61		
	12		.54	2.70
8:40		1.15		
	04		.04	.60
8:44		1.19		
	04		.02	.30
8:48		1.21		
	05		.07	.84
8:53		1.28		
	17		.0	.0
9:10		1.28		
	07		.06	.51
9:17		1.34		
	10		.18	1.08
9:27		1.52		
	05		.03	.36
9:32		1.55		
	05		.14	1.68
9:37		1.69		
	04		.02	.30
9:41		1.71		
	04		.05	.75
9:45		1.76		

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.55	.55	.55
date began	8/8	8/8	8/8
duration (hours)	5.75	5.75	5.75
Temperature (max. & min.)	95 & 70	95 & 70	95 & 70
Soil (major type)	Colby Silty Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	Listed*	Plowed**
height (ft.)	2.0 to 3.0		
date last cultivated	6/29/32	7/21/32	7/16/32
Soil loss (tons per acre)	.514	.646	.617
Remarks	*Wheat stubble was listed 6" deep, 42" rows.		

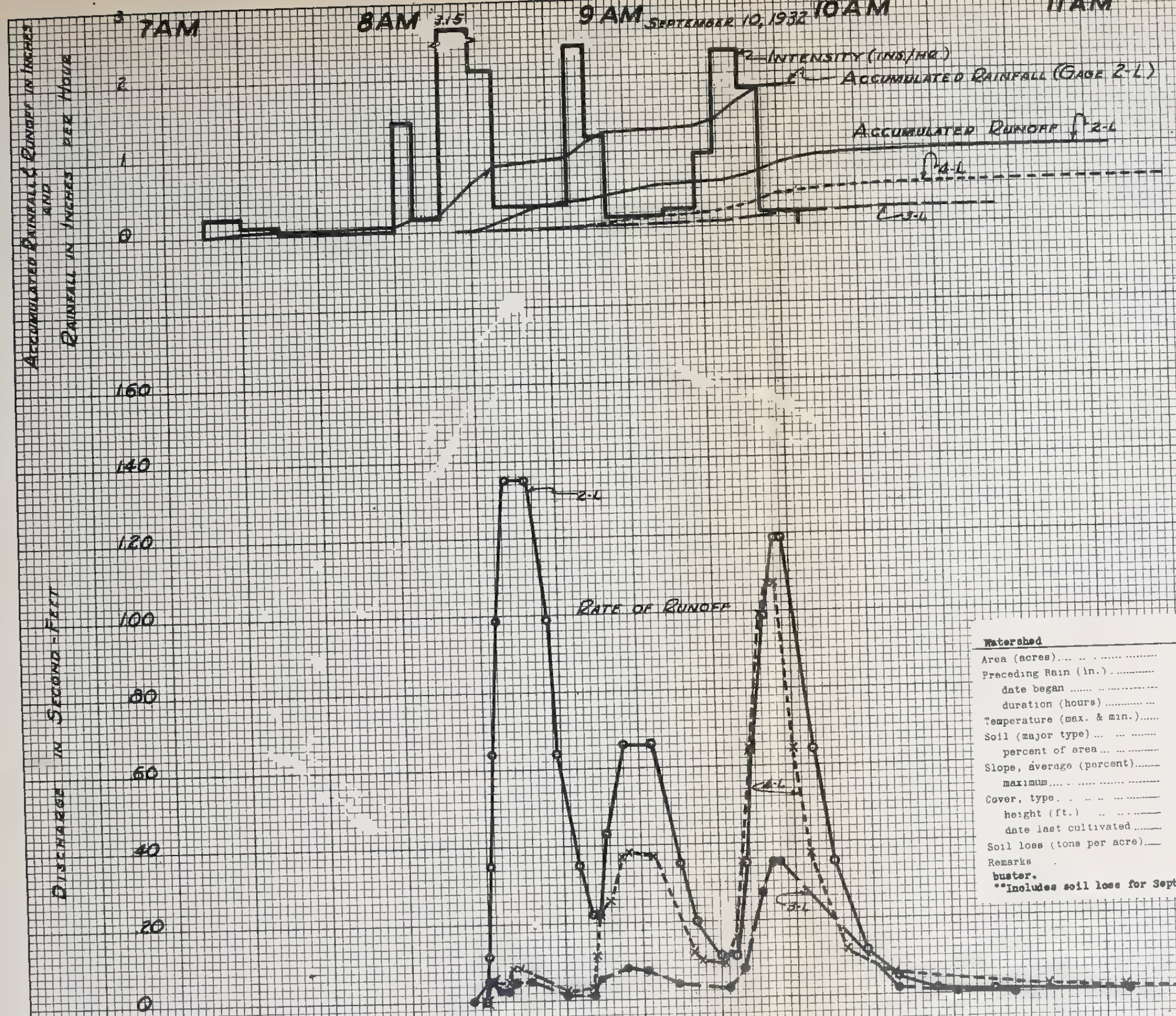
**Land plowed with moldboard plow 6" deep.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H BENNETT, CHIEF,
HAYS, KANSAS

STORM No. ..... August 12, 1932

Plot by LAM. date 11-39 checked by RRR/LAM date 12-15-39
Computations by LAM. date 11-39. checked by LAM/RRR date 12-15-39

Sheet 1 of 1 sheet.



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
7:10A		0		
	10		.04	.24
7:20		.04		
	10		.02	.12
7:30		.06		
	30		.01	.02
8:00		.07		
	05		.12	1.44
8:05		.19		
	07		.02	.17
8:12		.21		
	08		.42	3.15
8:20		.63		
	06		.21	2.10
8:26		.84		
	19		.10	.32
8:45		.94		
	05		.20	2.40
8:50		1.14		
	05		.10	1.20
8:55		1.24		
	15		.04	.16
9:10		1.28		
	08		.03	.23
9:18		1.31		
	05		.08	.96
9:23		1.39		
	07		.27	2.30
9:30		1.66		
	05		.15	1.80
9:35		1.81		
	10		.03	.18
9:45		1.84		

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.87	.87	.87
date began	8/30	8/30	8/30
duration (hours)	6.55	6.55	6.55
Temperature (max. & min.)	80 & 63	80 & 63	80 & 63
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	*	Tandem-Disked
height (ft.)	3.0 to 5.0		
date last cultivated	6/29/32	8/22/32	9/8/32
Soil loss (tons per acre)	**	**	**

Remarks

*Lister ridges were curled in by ridge buster.

**Includes soil loss for September 10 and 11 and recorded September 11th.

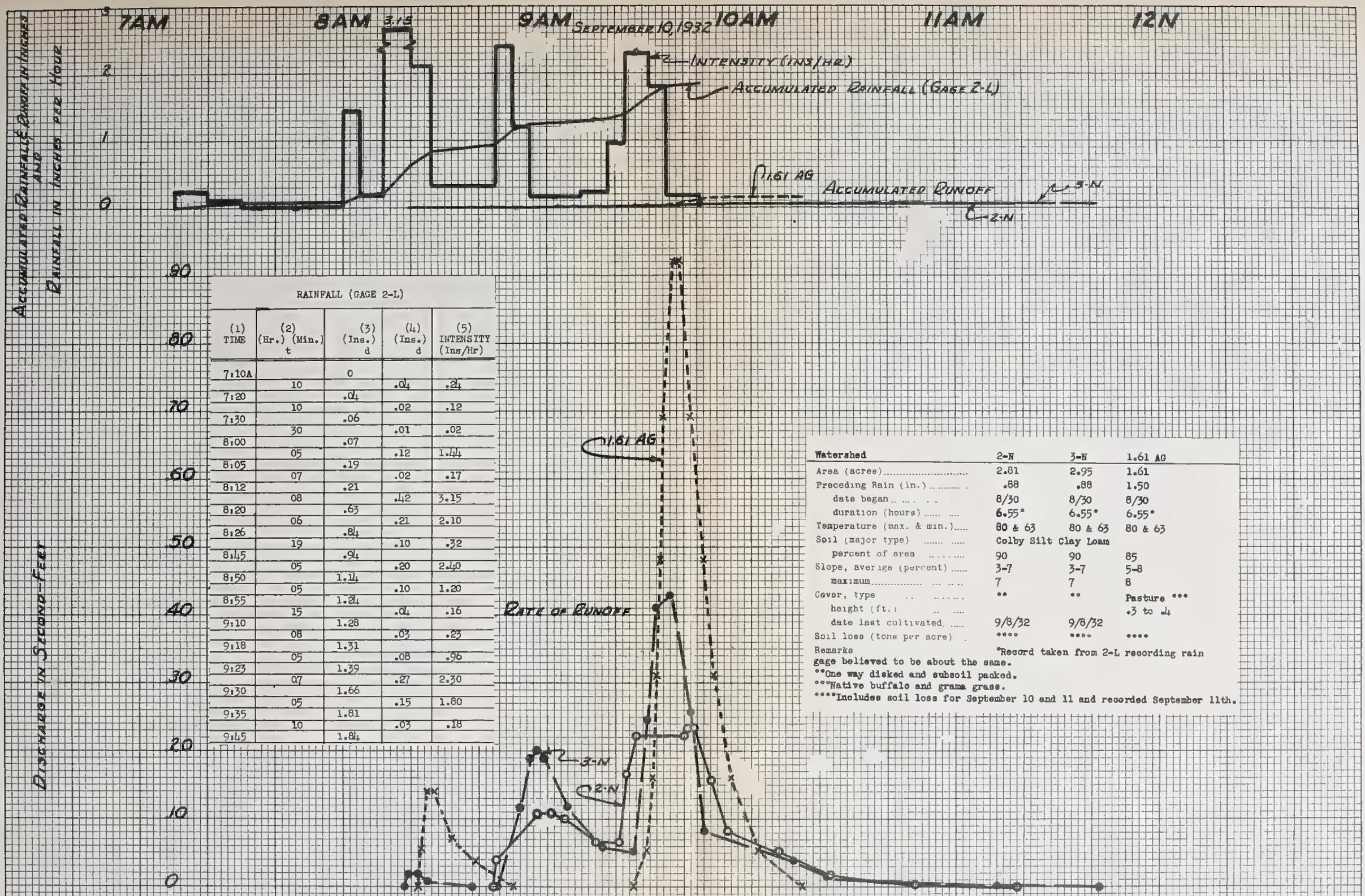
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF.
HAYS, KANSAS

STORM No. ..... AM. September 10, 1932

Plot by Sam date 11-38 checked by RRR & Sam date 12-15-38

Computations by Sam date 11-39 checked by Sam RRR date 12-15-39.

Sheet 1 of 2 sheets A.M.



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
7:10A		0		
	10		.04	.24
7:20		.04		
	10		.02	.12
7:30		.06		
	30		.01	.02
8:00		.07		
	05		.12	1.44
8:05		.19		
	07		.02	.17
8:12		.21		
	08		.42	3.15
8:20		.63		
	06		.21	2.10
8:26		.84		
	19		.10	.32
8:45		.94		
	05		.20	2.40
8:50		1.14		
	05		.10	1.20
8:55		1.24		
	15		.04	.16
9:10		1.28		
	08		.03	.23
9:18		1.31		
	05		.08	.96
9:23		1.39		
	07		.27	2.30
9:30		1.66		
	05		.15	1.80
9:35		1.81		
	10		.03	.18
9:45		1.84		

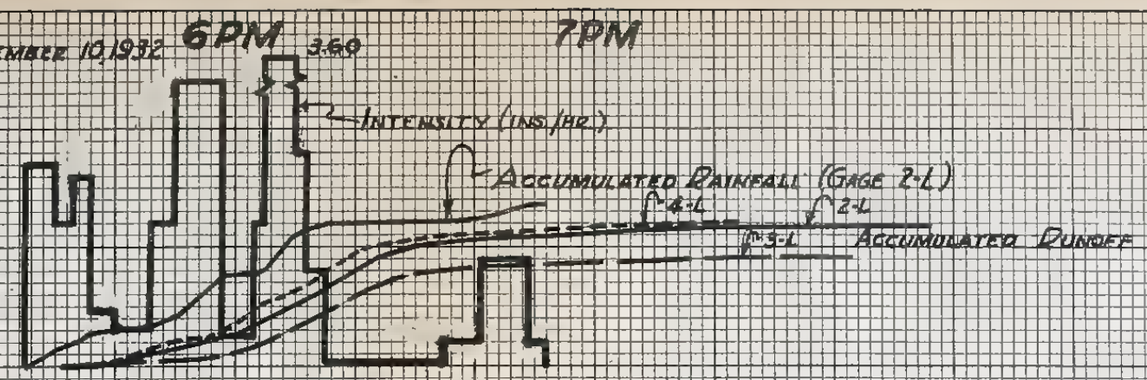
Watershed	2-N	3-N	1.61 AG
Area (acres)	2.81	2.95	1.61
Preceding Rain (in.)	.88	.88	1.50
date began	8/30	8/30	8/30
duration (hours)	6.55*	6.55*	6.55*
Temperature (max. & min.)	80 & 63	80 & 63	80 & 63
Soil (major type)	Colby Silt Clay Loam		
percent of area	90	90	85
Slope, average (percent)	3-7	3-7	5-8
maximum	7	7	8
Cover, type	**	**	Pasture ***
height (ft.)			.3 to .4
date last cultivated	9/8/32	9/8/32	
Soil loss (tons per acre)	****	****	****

Remarks

*Record taken from 2-L recording rain gage believed to be about the same.
**One way disked and subsoil packed.
***Native buffalo and grama grass.
****Includes soil loss for September 10 and 11 and recorded September 11th.

HAYS, KANSAS

September 10, 1932
A.M.
Sheet 2 of 2 sheets



ACCUMULATED RAINFALL, RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

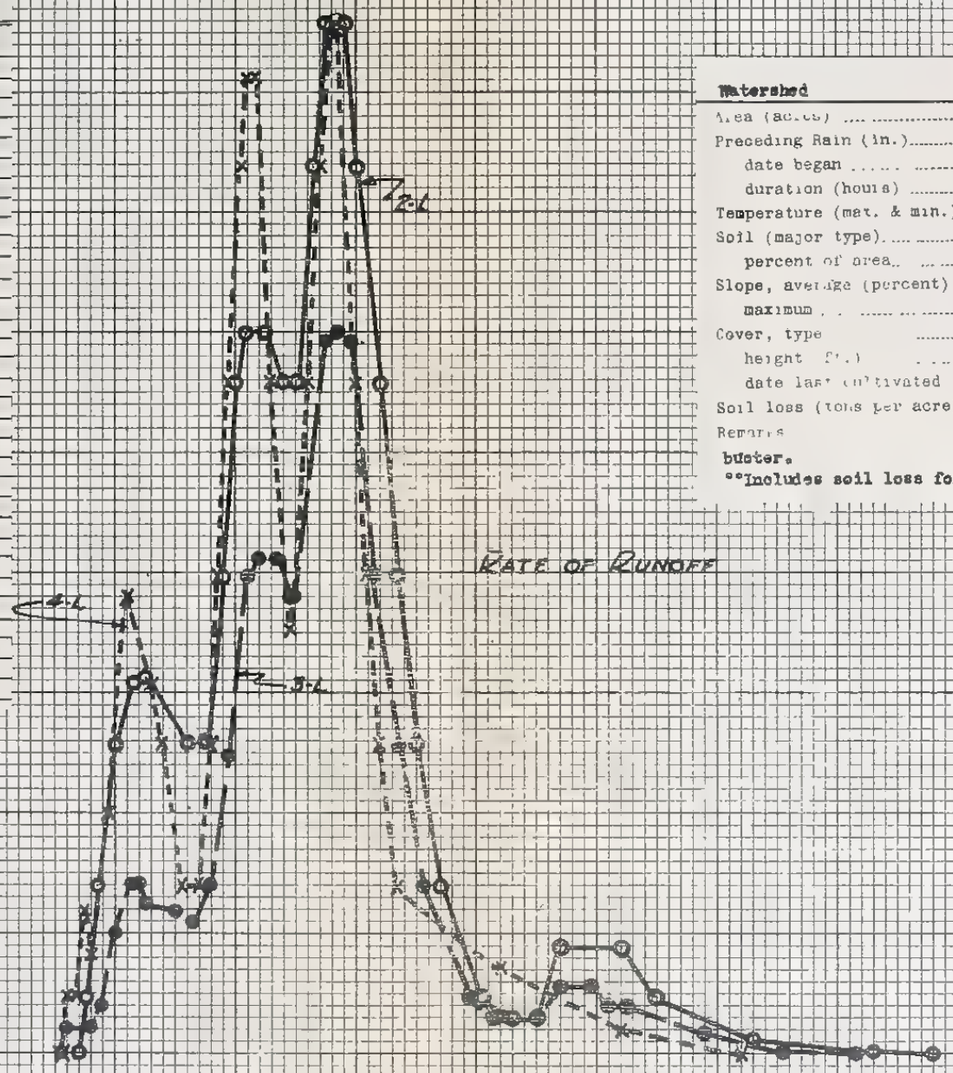
DISCHARGE IN SECOND-FEET

3
2
1
0

225
200
175
150
125
100
75
50
25
0

RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
5:25P		0		
	05		.14	1.68
5:30		.14		
	03		.06	1.20
5:33		.20		
	03		.08	1.60
5:36		.28		
	04		.03	.45
5:40		.31		
	06		.03	.30
5:46		.34		
	04		.08	1.20
5:50		.42		
	08		.32	2.40
5:58		.74		
	05		.02	.24
6:03		.76		
	02		.04	1.20
6:05		.80		
	05		.30	3.60
6:10		1.10		
	02		.06	1.80
6:12		1.16		
	03		.04	.80
6:15		1.20		
	20		.01	.03
6:35		1.21		
	06		.02	.20
6:41		1.23		
	08		.12	.90
6:49		1.35		
	03		.01	.20
6:52		1.36		



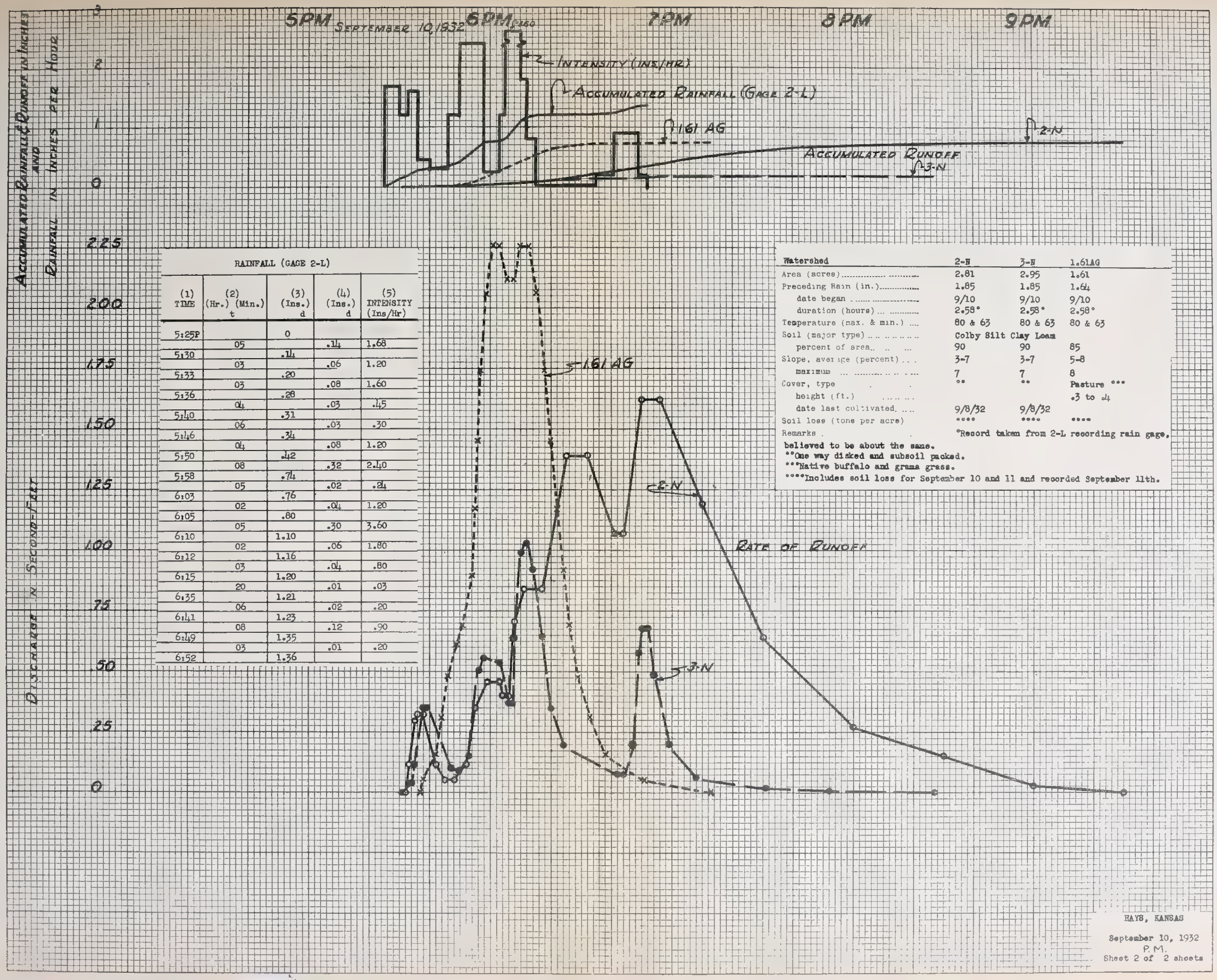
Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	1.84	1.84	1.84
date began	9/10	9/10	9/10
duration (hours)	2.58	2.58	2.58
Temperature (max. & min.)	80 &63	80 & 63	80 & 63
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	*	Tandem-Disked
height (ft.)	3.0 to 5.0		
date last cultivated	6/29/32	8/22/32	9/8/32
Soil loss (tons per acre)	**	**	**
Remarks	*Lister ridges were curled in by ridge buster. **Includes soil loss for September 10 and 11 and recorded September 11th.		

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF.
HAYS, KANSAS

STORM NO. ..... P.M. September 10, 1932

Plot by SAM date 11-39 checked by DHO + SAM date 12-15-39
Computations by SAM date 11-39 checked by SAM EHO date 12-15-39

Sheet 1 of 2 sheets PM.



RAINFALL (GAGE 2-L)

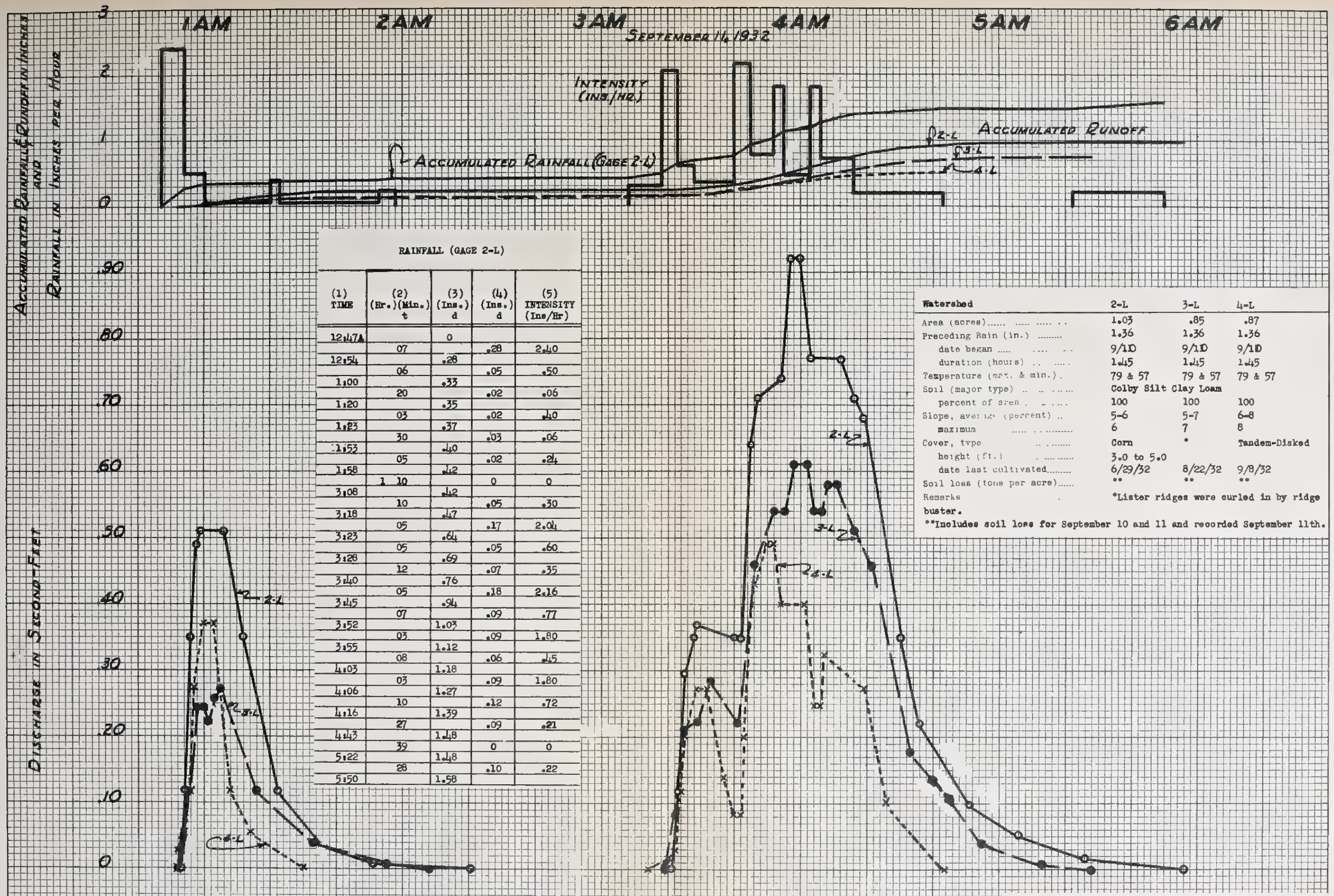
(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
5:25P		0		
	05		.14	1.68
5:30		.14		
	03		.06	1.20
5:33		.20		
	03		.08	1.60
5:36		.28		
	04		.03	.45
5:40		.31		
	06		.03	.30
5:46		.34		
	04		.08	1.20
5:50		.42		
	08		.32	2.40
5:58		.74		
	05		.02	.24
6:03		.76		
	02		.04	1.20
6:05		.80		
	05		.30	3.60
6:10		1.10		
	02		.06	1.80
6:12		1.16		
	03		.04	.80
6:15		1.20		
	20		.01	.03
6:35		1.21		
	06		.02	.20
6:41		1.23		
	08		.12	.90
6:49		1.35		
	03		.01	.20
6:52		1.36		

Watershed	2-N	3-N	1.61AG
Area (acres)	2.81	2.95	1.61
Preceding Rain (in.)	1.85	1.85	1.64
date began	9/10	9/10	9/10
duration (hours)	2.58°	2.58°	2.58°
Temperature (max. & min.)	80 & 63	80 & 63	80 & 63
Soil (major type)	Colby Silt Clay Loam		
percent of area	90	90	85
Slope, average (percent)	3-7	3-7	5-8
maximum	7	7	8
Cover, type	**	**	Pasture ***
height (ft.)			.3 to .4
date last cultivated	9/8/32	9/8/32	
Soil loss (tons per acre)	****	****	****
Remarks	°Record taken from 2-L recording rain gage, believed to be about the same.		

**One way disked and subsoil packed.
***Native buffalo and grama grass.
****Includes soil loss for September 10 and 11 and recorded September 11th.

HAYS, KANSAS

September 10, 1932
P.M.
Sheet 2 of 2 sheets



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
12:47A		0		
	07		.28	2.40
12:54		.28		
	06		.05	.50
1:00		.33		
	20		.02	.06
1:20		.35		
	03		.02	.40
1:23		.37		
	30		.03	.06
1:53		.40		
	05		.02	.24
1:58		.42		
	1 10		0	0
3:08		.42		
	10		.05	.30
3:18		.47		
	05		.17	2.04
3:23		.64		
	05		.05	.60
3:28		.69		
	12		.07	.35
3:40		.76		
	05		.18	2.16
3:45		.94		
	07		.09	.77
3:52		1.03		
	03		.09	1.80
3:55		1.12		
	08		.06	.45
4:03		1.18		
	03		.09	1.80
4:06		1.27		
	10		.12	.72
4:16		1.39		
	27		.09	.21
4:43		1.48		
	39		0	0
5:22		1.48		
	28		.10	.22
5:50		1.58		

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	1.36	1.36	1.36
date began	9/10	9/10	9/10
duration (hours)	1.45	1.45	1.45
Temperature (max. & min.)	79 & 57	79 & 57	79 & 57
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	*	Tandem-Disked
height (ft.)	3.0 to 5.0		
date last cultivated	6/29/32	8/22/32	9/8/32
Soil loss (tons per acre)	**	**	**
Remarks	*Lister ridges were curled in by ridge buster. **Includes soil loss for September 10 and 11 and recorded September 11th.		

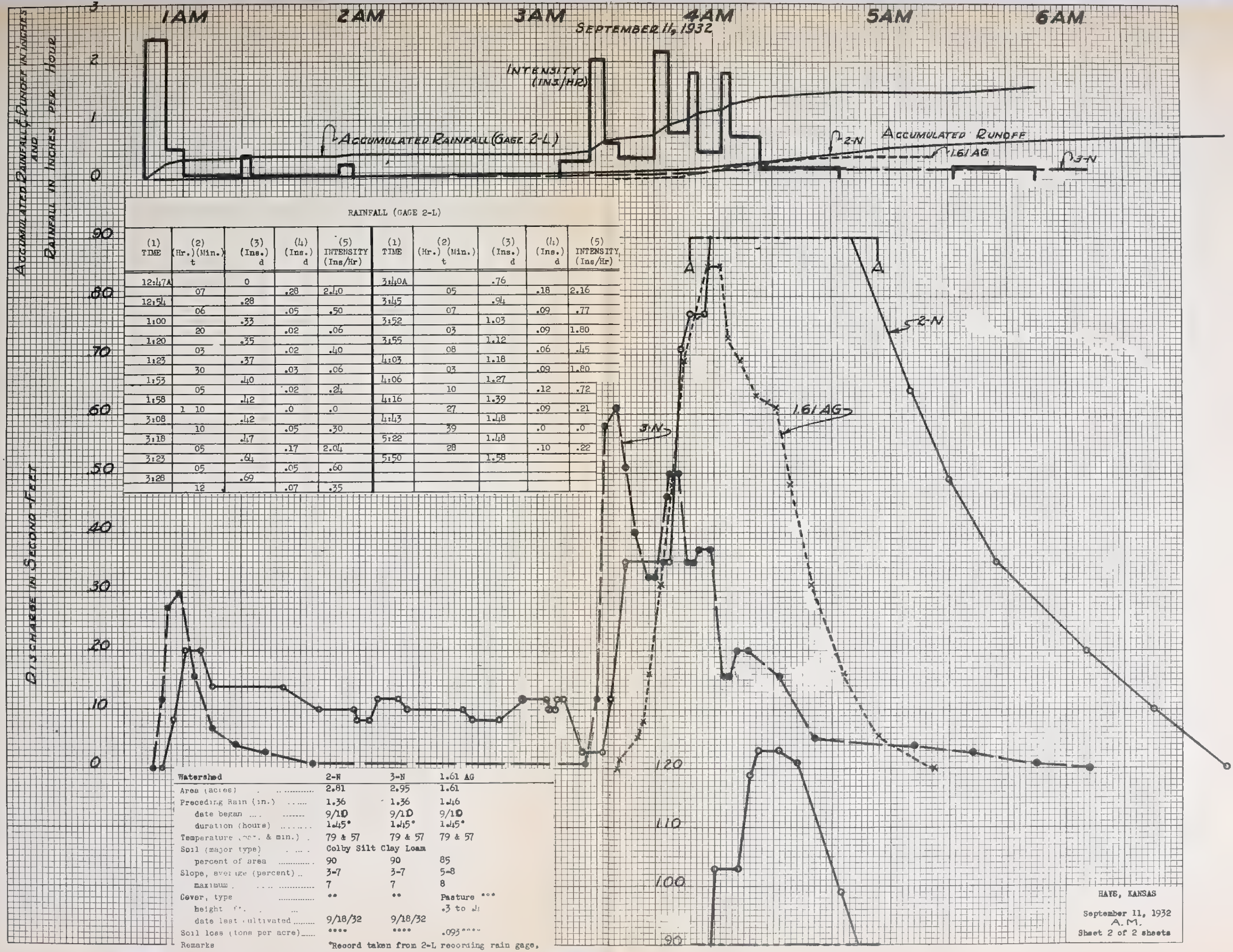
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT CHIEF.
HAYS, KANSAS

STORM NO..... A.M. September 11, 1932

Plot by SAM date 11-39 checked by RRR & SAM date 12-15-39

Computations by SAM date 11-39 checked by RRR & SAM date 12-15-39

Sheet 1 of 2 sheets A.M.



RAINFALL (GAGE 2-L)

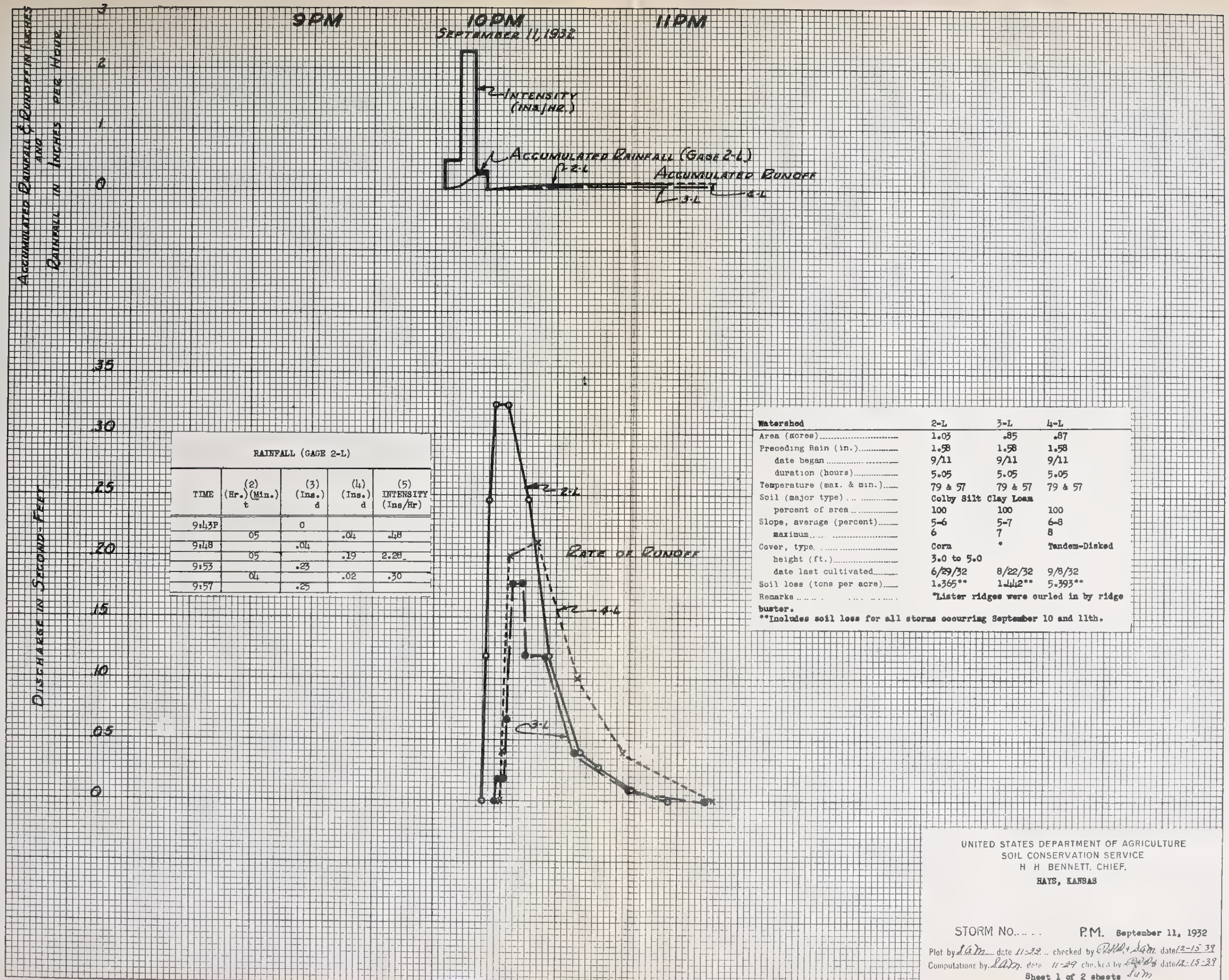
(1) TIME	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)	(1) TIME	(2) (Hr.) (Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
12:47A		0			3:40A		.76		
	07		.28	2.40		05		.18	2.16
12:54		.28			3:45		.94		
	06		.05	.50		07		.09	.77
1:00		.33			3:52		1.03		
	20		.02	.06		03		.09	1.80
1:20		.35			3:55		1.12		
	03		.02	.40		08		.06	.45
1:23		.37			4:03		1.18		
	30		.03	.06		03		.09	1.80
1:53		.40			4:06		1.27		
	05		.02	.24		10		.12	.72
1:58		.42			4:16		1.39		
	1 10		.0	.0		27		.09	.21
3:08		.42			4:43		1.48		
	10		.05	.30		39		.0	.0
3:18		.47			5:22		1.48		
	05		.17	2.04		28		.10	.22
3:23		.64			5:50		1.58		
	05		.05	.60					
3:28		.69							
	12		.07	.35					

Watershed	2-N	3-N	1.61 AG
Area (acres)	2.81	2.95	1.61
Preceding Rain (in.)	1.36	1.36	1.46
date began	9/10	9/10	9/10
duration (hours)	1.45*	1.45*	1.45*
Temperature (max. & min.)	79 & 57	79 & 57	79 & 57
Soil (major type)	Colby Silt Clay Loam		
percent of area	90	90	85
Slope, average (percent)	3-7	3-7	5-8
maximum	7	7	8
Cover, type	**	**	Pasture ***
height ft.			.3 to .4
date last cultivated	9/18/32	9/18/32	
Soil loss (tons per acre)	****	****	.095****
Remarks			

*Record taken from 2-L recording rain gage, believed to be about the same.
**One way disked and subsoil packed.
***Native buffalo and grama grass.
****Includes soil loss for September 10 and 11 and recorded September 11th.

HAYS, KANSAS

September 11, 1932
A.M.
Sheet 2 of 2 sheets



RAINFALL (GAGE 2-L)

TIME	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
9:43P		0		
	05		.04	.48
9:48		.04		
	05		.19	2.28
9:53		.23		
	04		.02	.30
9:57		.25		

Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	1.58	1.58	1.58
date began	9/11	9/11	9/11
duration (hours)	5.05	5.05	5.05
Temperature (max. & min.)	79 & 57	79 & 57	79 & 57
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Corn	*	Tandem-Disked
height (ft.)	3.0 to 5.0		
date last cultivated	6/29/32	8/22/32	9/8/32
Soil loss (tons per acre)	1.365**	1.442**	5.393**
Remarks	*Lister ridges were curled in by ridge buster.		

**Includes soil loss for all storms occurring September 10 and 11th.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF.
HAYS, KANSAS

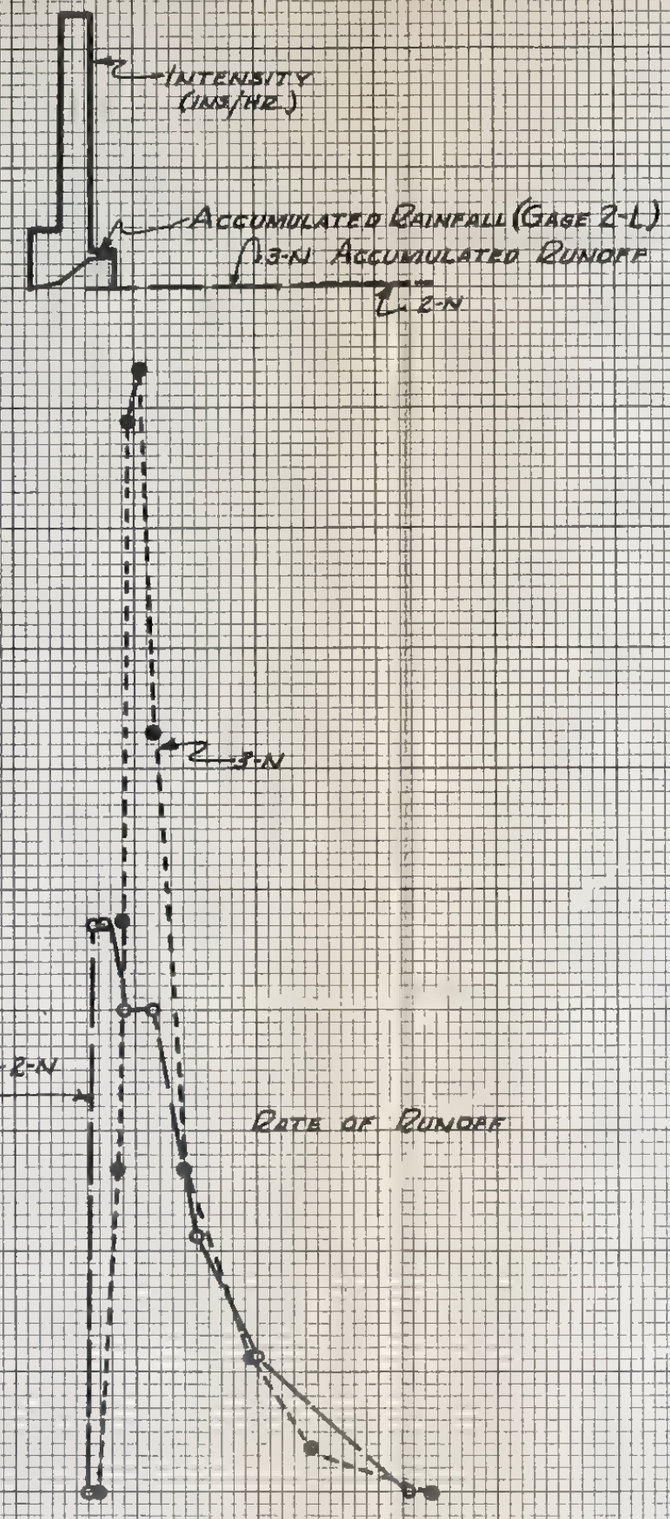
STORM NO.... P.M. September 11, 1932

Plot by LAM date 11-32 .. checked by EWH + LAM date 12-15-39
Computations by LAM date 11-29 checked by EWH date 12-15-39
Sheet 1 of 2 sheets LAM

P.M.

9PM 10PM 11PM

SEPTEMBER 11, 1932



ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

3 2 1 0 .20 .15 .10 .05 0

DISCHARGE IN SECOND-FEET

10 .05 0

RAINFALL (GAGE 2-L)

TIME	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (Ins/Hr)
9:43P		0		
	05		.04	.48
9:48		.04		
	05		.19	2.28
9:53		.23		
	04		.02	.30
9:57		.25		

Watershed	2-N	3-N
Area (acres)	2.81	2.95
Preceding Rain (in.)	1.57	1.57
date began	9/11	9/11
duration (hours)	5.05*	5.05*
Temperature (max. & min.)	79 & 57	79 & 57
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	**	**
height (ft.)		
date last cultivated	9/8/32	9/8/32
Soil loss (tons per acre)	1.030**	.719**
Remarks	*Record taken from 2-L recording rain gage, believed to be about the same. **One way disked and subsoil packed. ***Includes soil loss for all storms occurring September 10 and 11th.	

HAYS, KANSAS

September 11, 1932
P. M.
Sheet 2 of 2 sheets

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH January, February, March, April, 1933

SHEET 1 OF 4 SHEETS

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED 1933.
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Jan. 17			U. S. WEATHER BUREAU			.04	Standard Gage			28	16	No Runoff							2-L. Terraced Area. Colby silt clay loam. Average land slope 5 to 6%. Vertical spacing 4'. Grade constant 4". Corn stalks cut 3/17. Plowed by one-way disc 4/10. Seeded to barley 4/14. Barley harvested 7/6. Blank listed 7/12. Lister ridges curled in 9/1. Plowed by one-way disc 9/16. Seeded to wheat 9/26.
18			do	do	do	.03	do		do	60	22	do	do						
21			do	do	do	T	do		do	67	27	do	do						
Febr. 7			do	do	do	.15	do		do	0	-14	do	do						
10			do	do	do	T	do		do	20	- 7	do	do						
13			do	do	do	T	do		do	21	12	do	do						3-L. Terraced Area. Colby silt clay loam. Average land slope 5 to 7%. Vertical spacing 4'. Grade constant 4". Lister ridges curled in 5/15. Plowed by tandem disc 5/17. Planted to corn 6/9. Corn cultivated 6/26. Corn cultivated 7/5. Corn harvested 11/10.
17			do	do	do	T	do		do	48	28	do	do						
27			do	do	do	.06	do		do	57	35	do	do						
March 4			2-L	6:25A	155	.10	.48	.16	.08	55	39	do	do						
24			2-L	3:40A	165	.22	.72	.28	.16	65	36	do	do						4-L. Terraced Area. Colby silt clay loam. Average land slope 6 to 8%. Vertical spacing 4'. Grade constant 4". Wheat harvested 6/30. Blank listed 7/12. Lister ridges curled in 9/1. Plowed by one-way disc 9/16. Subsoil packed 9/16. Blank listed 11/10.
Apr.19-20*	2-L	1.03	2-L	8:35P	285	1.27	5.40	2.80	1.64	86	49	11:03P	12:22A	.130	.32	11:06P	1.14	.172	
*	3-L	.85	2-L	do	do	1.27	do	do	do	do	do	10:54P	12:10A	.065	.08	11:02P	1.20	.034	
*	4-L	.87	2-L	do	do	1.27	do	do	do	do	do	10:56P	11:16P	.029	.14	11:04P	1.24	.009	
*	2-N	2.81	3-N	do	do	1.18	do	do	do	do	do	11:02P	11:23P	.069	.05	11:04P	1.11	None	
*	3-N	2.95	3-N	do	do	1.18	do	do	do	do	do	10:52P	12:08A	.209	.21	11:02P	.97	do	
*	1.61AC	1.61	U. S. WEATHER BUREAU			1.26	Standard Gage			do	do	10:53P	11:15P	.228	.23	10:57P	1.03	do	
21			2-L	2:28A	377	.22	.24	.16	.10	64	47	No Runoff							
21*	2-L	1.03	2-L	3:22P	15	.25	1.92	1.00		64	47	3:36P	4:45P	.040	.07	3:41P	.21	.096	
	3-L	.85	2-L	do	do	.25	do	do		do	do	Estimated		.022	---	---	.23		
	4-L	.87	2-L	do	do	.25	do	do		do	do	do		.019	---	---	.23		
	2-N	2.81	3-N	do	do	.23	do	do		do	do	do		.004	---	---	.23		

* Hydrographs plotted for these storms.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH April, May, June, July, 1933

SHEET 2 OF 4 SHEETS

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)
April 22			2-L	5:20P	155	.20	.36	.16	.14	61	49	No	Runoff					
23			2-L	4:52P	15	.04	.24	.16	.08	55	47	do	do					
May 1			2-L	3:45A	300	.27	.72	.40	.26	71	43	do	do					
3			2-L	4:30	165	.30	.24	.20	.16	69	43	do	do					
3-4			2-L	10:05A	1170	.25	.24	.16	.12	69	43	do	do					
4*	2-L	1.03	2-L	10:15A	645	.99	.25	.25	.25	54	44	7:00P	9:00P	.039	.03	7:30P	.95	
	3-L	.85	2-L	do	do	.99	do	do	do	do	do	Estimated		.041	---	---	.95	
	4-L	.87	2-L	do	do	.99	do	do	do	do	do	do		.025	---	---	.96	
	2-N	2.81	3-N	do	do	.98	do	do	do	do	do	do		.010	---	---	.97	
*	3-N	2.95	3-N	do	do	.98	do	do	do	do	do	6:52P	9:07P	.011	.03	7:40P	.97	
11			2-L	10:20P	15	.10	.60	.40	.20	65	44	No	Runoff					
22			2-L	7:35P	25	.11	.48	.36	.22	89	65	do	do					
25			2-L	5:00P	570	.32	.24	.16	.14	70	56	do	do					
26			2-L	9:05P	30	.16	.72	.44	.32	80	47	do	do					
June 12			2-L	6:25A	230	.31	.60	.48	.28	95	61	do	do					
20			2-L	---	---	.04	---	---	---	90	65	do	do					
20-21	2-L	1.03	2-L	10:48P	212	.59	.84	.80	.58	92	65	Estimated		.012	---	---	.58	
July 5	2-L	1.03	2-L	5:35P	25	.46	2.64	1.80	.92	99	70	Estimated		.025	---	---	.43	

* Hydrographs plotted for these storms.

CONDITION OF WATERSHED

2-N. Terraced Area.
Colby silt clay loam.
Average land slope 3 to 7%.
Vertical spacing 2'.
Grade constant level.
Wheat harvested 6/29.
Blank listed 7/5/33.
Lister ridges curled in 9/1.
Plowed by one-way disc 9/11.
Subsoil packed 9/11.
Seeded to wheat 9/26.

3-N. Terraced Area.
Colby silt clay loam.
Average land slope 3 to 7%.
Vertical spacing 3'.
Grade constant level.
Wheat harvested 6/29.
Blank listed 7/10.
Lister ridges curled in 9/1.
Plowed by one-way disc 9/11.
Subsoil packed 9/11.
Seeded to wheat 9/25.

1.61 AG. Pasture Area.
Colby silt clay loam.
Average land slope 5 to 8%.
Cover of native buffalo and gramma grass.
No grazing except by cattle during the growing season.
Not over grazed at any time.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH July, August, 19 33

SHEET 3 OF 4 SHEETS

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	
July 8			2-L	1:13A	15	.18	1.32	.72	.36	96	70	No	Runoff						
14			2-L	1:35P	45	.46	1.32	1.00	.80	96	66	do	do						
18			2-L	7:37A	253	.42	.96	.64	.42	83	64	do	do						
23			2-L	12:17A	35	.20	.96	.68	.40	87	64	do	do						
Aug. 2			2-L	12:15A	12	.07	.60	.28	.14	90	70	do	do						
7			2-L	---	---	.07	---	---	---	106	72	do	do						
8			2-L	9:15P	05	.03	.36	.12	.06	103	70	do	do						
10			2-L	5:05A	60	.08	.24	.12	.08	95	72	do	do						
12			2-L	1:54A	06	.03	.24	.12	.06	100	63	do	do						
14			2-L	---	---	.01	.12	.04	.02	91	55	do	do						
16			2-L	12:30A	110	.20	.24	.20	.18	94	63	do	do						
19			2-L	7:35P	255	.29	.84	.44	.24	90	73	do	do						
22	3-L	.85	2-L	12:55A	210	1.04	2.52	1.72	1.14	84	65	Estimated		.004	---	---	1.04		
*	1.61AG	1.61	U. S. WEATHER BUREAU		1.10		Standard Gage			do	do	4:12A	4:43A	.078	.76	4:20A	1.02	.009	
24			2-L	---	---	.01	.12	.04	.02	83	61	No	Runoff						
27			2-L	5:30A	435	.23	.24	.16	.16	75	65	No	Runoff						

* Hydrographs plotted for these storms.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

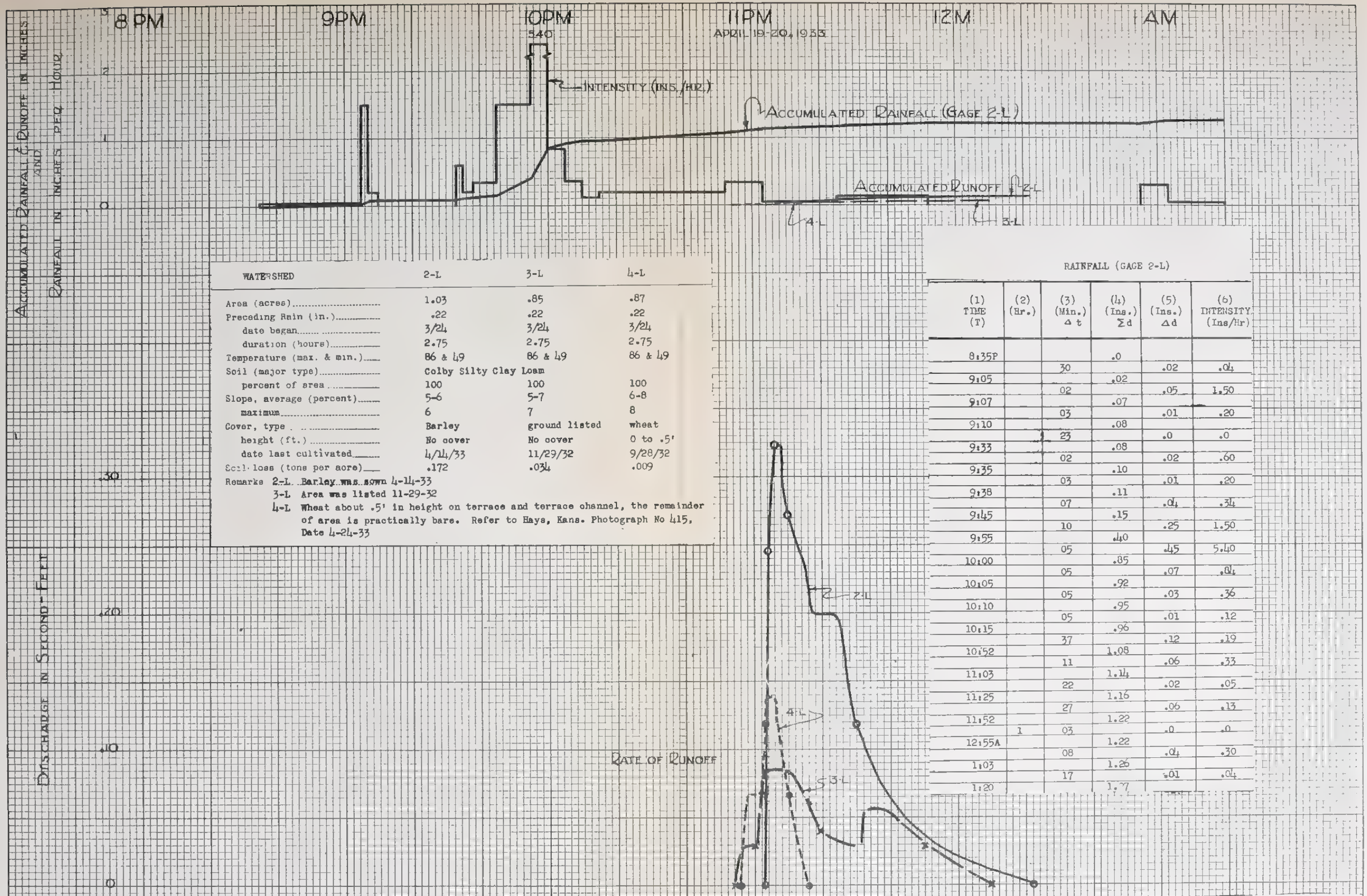
PROJECT HAYS, KANSAS

MONTH August, September, October November, December, 1933

SHEET 4 OF 4 SHEETS

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	
Aug. 29			2-L	2:00A	190	.36	.48	.36	.30	75	60	No	Runoff						
Sept. 2			2-L	9:35P	245	.85	.96	.88	.80	94	68	No	Runoff						
11	3-L	.85	2-L	10:15P	205	.90	2.40	1.20	1.04	96	67	Estimated		.026	---	---	.87		
28			2-L	2:20A	33	.28	2.16	.80	.64	77	53	No	Runoff						
Oct. 3			2-L	5:30P	20	.04	.12	.12	.08	79	44	do	do						
Nov. 1			2-L	11:00P	225	.18	.36	.28	.20	83	45	do	do						
6			2-L	1:30A	60	.06	.12	.08	.06	37	24	do	do						
30			2-L	7:30P	560	.14	.24	.20	.12	58	30	do	do						
Dec. 1*	2-L	1.03	2-L	12:27P	320	1.83	1.50	1.28	0.94	57	38	4:14A	6:10A	.049	.07	4:48A	1.78	None	
*	3-L	.85	2-L	do	do	1.83	do	do	do	do	do	4:13A	6:14A	.179	.30	4:35A	1.65	.075	
	2-N	2.81	3-N	do	do	1.77	do	do	do	do	do	Estimated		.025	---	---	1.74		
	3-N	2.95	3-N	do	do	1.77	do	do	do	do	do	do		.033	---	---	1.74		
	1.61AG	1.61	U. S. WEATHER BUREAU			.21	Standard Gage			57	38	do		.025	---	---	1.93		
2			U. S. WEATHER BUREAU			.21	Standard Gage			57	32	No	Runoff						

* Hydrographs plotted for these storms.



WATERSHED	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.22	.22	.22
date began	3/24	3/24	3/24
duration (hours)	2.75	2.75	2.75
Temperature (max. & min.)	86 & 49	86 & 49	86 & 49
Soil (major type)	Colby Silty Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Barley	ground listed	wheat
height (ft.)	No cover	No cover	0 to .5'
date last cultivated	4/14/33	11/29/32	9/28/32
Soil loss (tons per acre)	.172	.034	.009

Remarks 2-L Barley was sown 4-14-33
3-L Area was listed 11-29-32
4-L Wheat about .5' in height on terrace and terrace channel, the remainder of area is practically bare. Refer to Hays, Kans. Photograph No 415, Date 4-24-33

RAINFALL (GAGE 2-L)

(1) TIME (T)	(2) (Hr.)	(3) (Min.) Δ t	(4) (Ins.) Σ d	(5) (Ins.) Δ d	(6) INTENSITY (Ins/Hr)
8:35P			.0		
		30		.02	.04
9:05			.02		
		02		.05	1.50
9:07			.07		
		03		.01	.20
9:10			.08		
		23		.0	.0
9:33			.08		
		02		.02	.60
9:35			.10		
		03		.01	.20
9:38			.11		
		07		.04	.34
9:45			.15		
		10		.25	1.50
9:55			.40		
		05		.45	5.40
10:00			.85		
		05		.07	.84
10:05			.92		
		05		.03	.36
10:10			.95		
		05		.01	.12
10:15			.96		
		37		.12	.19
10:52			1.08		
		11		.06	.33
11:03			1.14		
		22		.02	.05
11:25			1.16		
		27		.06	.13
11:52			1.22		
	1	03		.0	.0
12:55A			1.22		
		08		.04	.30
1:03			1.26		
		17		.01	.04
1:20			1.27		

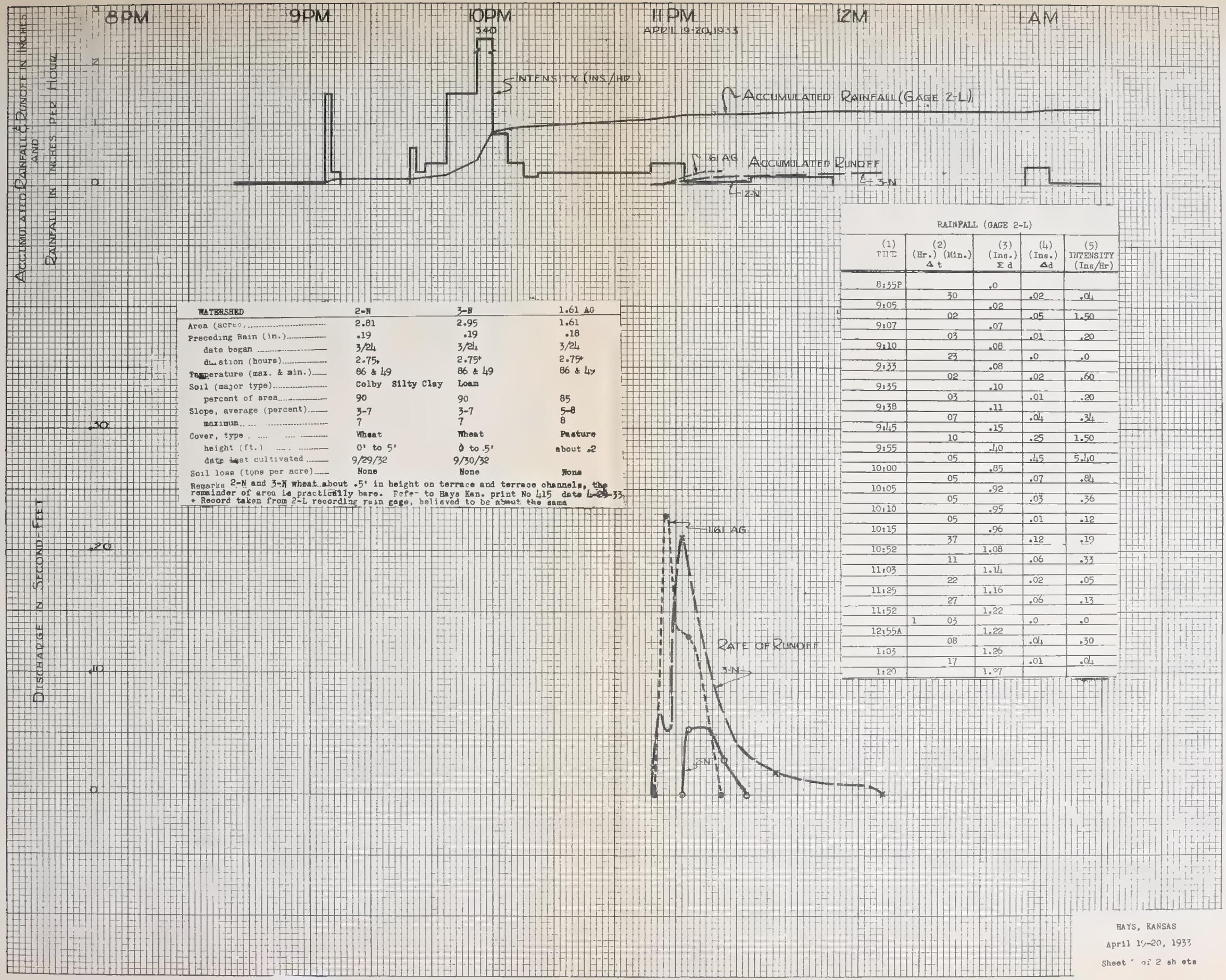
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF.

HAYS, KANSAS

STORM No. ..... April 19-20, 1933

Plot by S.A.M. date 7-31-39 checked by L.A.M. & R.R.D. date Oct 1939
Computations by S.A.M. date 7-28-39 checked by L.A.M. R.R.D. date Oct 1939

Sheet 1 of 2 sheets



WATERSHED	2-N	3-N	1.61 AG
Area (acres)	2.81	2.95	1.61
Preceding Rain (in.)	.19	.19	.18
date began	3/24	3/24	3/24
duration (hours)	2.75+	2.75+	2.75+
Temperature (max. & min.)	86 & 49	86 & 49	86 & 49
Soil (major type)	Colby Silty Clay	Loam	
percent of area	90	90	85
Slope, average (percent)	3-7	3-7	5-8
maximum	7	7	8
Cover, type	Wheat	Wheat	Pasture
height (ft.)	0' to 5'	0 to .5'	about .2
date last cultivated	9/29/32	9/30/32	
Soil loss (tons per acre)	None	None	None

Remarks 2-N and 3-N wheat about .5' in height on terrace and terrace channels, the remainder of area is practically bare. Refer to Hays Kan. print No 415 date 4-25-33

+ Record taken from 2-L recording rain gage, believed to be about the same

RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
8:35P		.0		
	30		.02	.04
9:05		.02		
	02		.05	1.50
9:07		.07		
	03		.01	.20
9:10		.08		
	23		.0	.0
9:33		.08		
	02		.02	.60
9:35		.10		
	03		.01	.20
9:38		.11		
	07		.04	.34
9:45		.15		
	10		.25	1.50
9:55		.40		
	05		.45	5.40
10:00		.85		
	05		.07	.84
10:05		.92		
	05		.03	.36
10:10		.95		
	05		.01	.12
10:15		.96		
	37		.12	.19
10:52		1.08		
	11		.06	.33
11:03		1.14		
	22		.02	.05
11:25		1.16		
	27		.06	.13
11:52		1.22		
	1 03		.0	.0
12:55A		1.22		
	08		.04	.30
1:03		1.26		
	17		.01	.04
1:20		1.27		

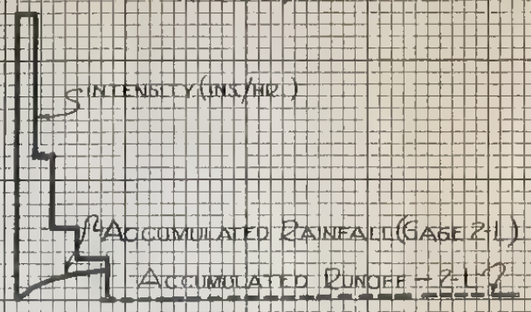
HAYS, KANSAS

April 19-20, 1933

Sheet ' of 2 sh ets

3 PM 4 PM 5 PM

APRIL 21, 1933



ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

.07
.06
.05
.04
.03
.02
.01
0

RATE OF RUNOFF 2-L

RAINFALL (GAGE 2-L)

(1) TIME (T)	(2) (Hr.)	(3) (Mins.) Δ t	(4) (Ins.) Σ d	(5) (Ins.) Δd	(6) INTENSITY (Ins/Hr)
3:22P			.0		
		03		.12	2.40
3:25			.12		
		03		.06	1.20
3:28			.18		
		04		.04	.60
3:32			.22		
		05		.03	.36
3:37			.25		

WATERSHED	2-L
Area (acres)	1.03
Preceding Rain (in.)	.22
date began	4/21
duration (hours)	6.28
Temperature (max. & min.)	64-47
Soil, major type	Colby Silty Clay Loam
percent of area	100
Slope, average (percent)	5-6
maximum	6
Cover, type	Barley
height (ft.)	No cover
date last cultivated	4/14/33
Soil loss (tons per acre)	.096
Remarks	

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF,

HAYS, KANSAS

STORM NO. ..... April 21, 1933

Plot by SAM date 8-1-39 checked by [illegible] date Oct 1939
Computations by SAM date 8-1-39 checked by [illegible] date Oct 1939

Sheet 1 of 1 Sheet

10AM 11AM 12N 1PM 2PM 3PM

MAY 4, 1933
SHEET 1 OF 2 SHEETS

ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

2

0

INTENSITY (INS/HR.)

ACCUMULATED RAINFALL (GAGE 2-L)

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF.

HAYS, KANSAS

STORM No. ....

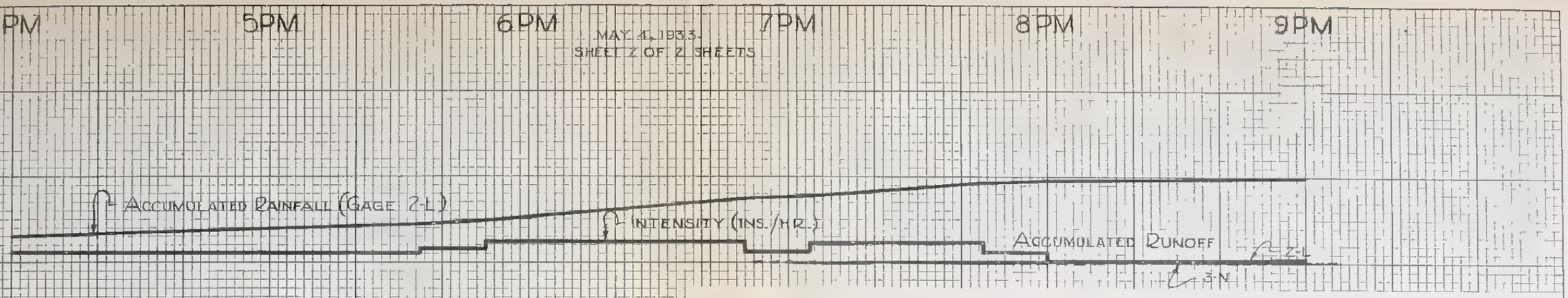
May 4, 1933

Plot by SAM date 8-2-39 checked by [illegible] date Oct 1939

Computations by SAM. date 8-2-39 checked by [illegible] date Oct. 1939

Sheet 1 of 2 sheets

MAY 4, 1933.
SHEET 2 OF 2 SHEETS



Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour

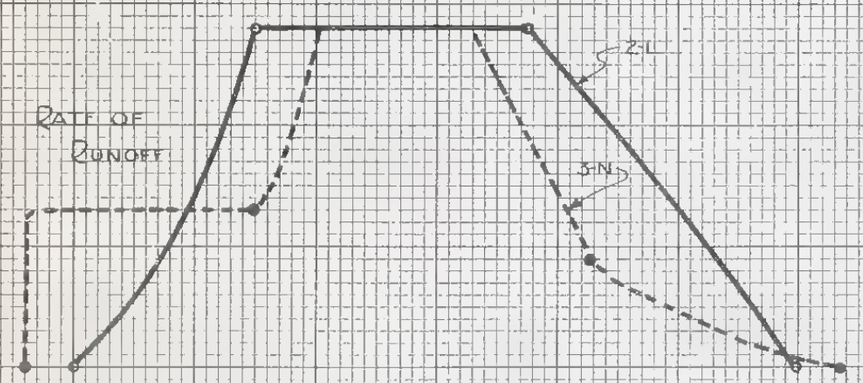
Discharge in Second-Feet

RAINFALL (GAGE 2-L)

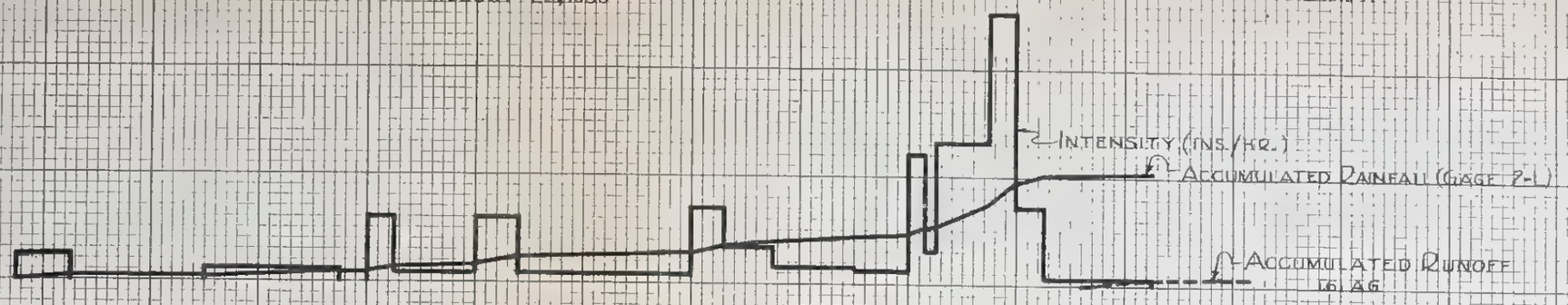
(1) TIME (T)	(2) (Hr.)	(3) (Min.) Δ t	(4) (Ins.) Σ d	(5) (Ins.) Δ d	(6) INTENSITY (Ins/Hr)	(1) TIME (T)	(2) (Hr.)	(3) (Min.) Δ t	(4) (Ins.) Σ d	(5) (Ins.) Δ d	(6) INTENSITY (Ins/Hr)
10:15A			.0			3:35			.22		
		35		.02	.03			10		.04	.24
10:50			.02			3:45			.26		
	1	00		.08	.08		1	50		.20	.11
11:50			.10			5:35			.46		
		40		.0	.0			15		.04	.16
12:30P			.10			5:50			.50		
		30		.02	.04		1	00		.25	.25
1:00			.12			6:50			.75		
		35		.0	.0			15		.03	.12
1:35			.12			7:05			.78		
		15		.02	.08			40		.16	.24
1:50			.14			7:45			.94		
		15		.04	.16			15		.03	.12
2:05			.18			8:00			.97		
		45		.0	.0		1	00		.02	.02
2:50			.18			9:00			.99		
		30		.02	.04						
3:20			.20								
		15		.02	.08						

WATERSHED	2-L	3-N
Area (acres)	1.03	2.95
Preceding Rain (in.)	.25	.22
date began	5/3	5/3
duration (hours)	19.50	19.50+
Temperature (max. & min.)	54 & 44	54 & 44
Soil (major type)	Colby Silty Clay Loam	
percent of area	100	90
Slope, average (percent)	5-6	3-7
maximum	6	7
Cover, type	Barley	Wheat
height (ft.)	.2'	.7'
date last cultivated	4/14/33	9/30/32
Soil loss (tons per acre)	None	None

Remarks The wheat on the 2.95 acre area is approximately .7' in height along terrace and terrace channel, the remainder of area is practically bare although recent rains have revived the plants.
The barley is up. Leaves are straight and about .2' high which offers little to no protection.
+ Record taken from 2-L recording rain gage believed to be about the same



HAYS, KANSAS
May 4, 1933
Sheet 2 of 2 sheets



ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET

RATE OF RUNOFF 1.61 AG

RAINFALL (GAGE 2-L)

(1) TIME (T)	(2) (Hr.)	(3) (Min.) Δ t	(4) (Ins.) Σ d	(5) (Ins.) Δd	(6) INTENSITY (Ins/Hr)
12:55A			.0		
		10		.04	.24
1:05A			.04		
		25		.0	.0
1:30			.04		
		25		.05	.12
1:55			.09		
		05		.0	.0
2:00			.09		
		05		.05	.60
2:05			.14		
		15		.02	.08
2:20			.16		
		08		.08	.60
2:28			.24		
		32		.04	.08
3:00			.28		
		06		.07	.70
3:06			.35		
		09		.05	.33

(1) TIME (T)	(2) (Hr.)	(3) (Min.) Δ t	(4) (Ins.) Σ d	(5) (Ins.) Δd	(6) INTENSITY (Ins/Hr)
3:15			.40		
		15		.04	.16
3:30			.44		
		10		.02	.12
3:40			.46		
		03		.06	1.20
3:43			.52		
		02		.01	.30
3:45			.53		
		10		.22	1.32
3:55			.75		
		05		.21	2.52
4:00			.96		
		05		.06	.72
4:05			1.02		
		20		.02	.06
4:25			1.04		

WATERSHED	1.61 AG
Area (acres)	1.61
Preceding Rain (in.)	.29+
date began	8/19
duration (hours)	4.25+
Temperature (max. & min.)	84 & 65
Soil (major type)	Colby Silty Clay Loam
percent of area	85
Slope, average (percent)	5-8
maximum	8
Cover, type	Native Buffalo and grama grass pasture
height (ft.)	about .1'
date last cultivated	
Soil loss (tons per acre)	.009

Remarks + Record taken from 2-L recording rain gage, believed to be about the same.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF

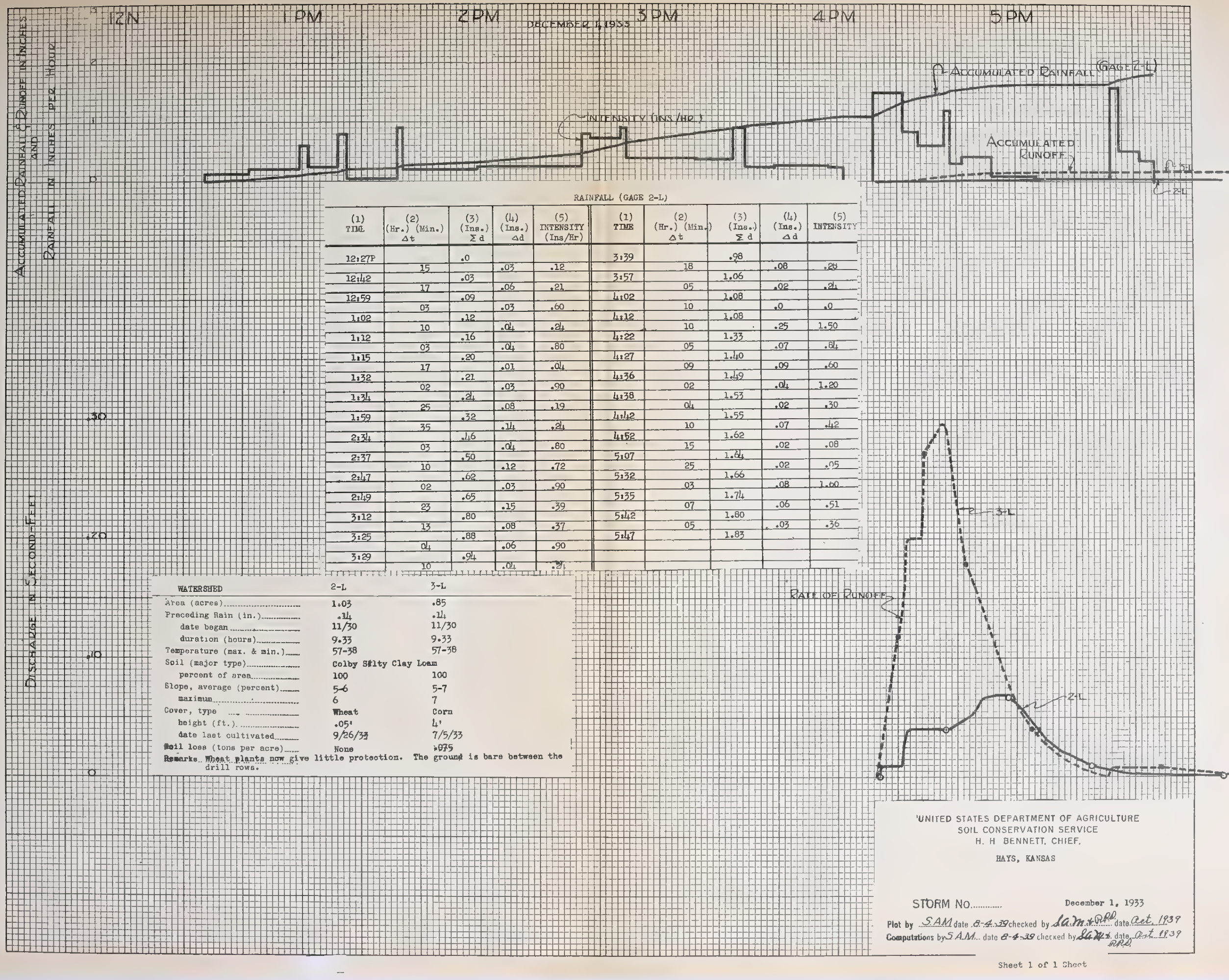
HAYS, KANSAS

STORM NO. ... August 22, 1933

Plot by S.A.M. date 8-3-39 checked by S.A.M.+ORD date Oct 1939

Computations by S.A.M date 8-3-39 checked by S.A.M.+ORD date Oct 1939

Sheet 1 of 1 Sheet



RAINFALL (GAGE 2-L)

(1) TIME	(2) (Hr.) (Min.) Δt	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (Ins/Hr)	(1) TIME	(2) (Hr.) (Min.) Δt	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY
12:27P		.0			3:39		.98		
	15		.03	.12		18		.08	.28
12:42		.03			3:57		1.06		
	17		.06	.21		05		.02	.24
12:59		.09			4:02		1.08		
	03		.03	.60		10		.0	.0
1:02		.12			4:12		1.08		
	10		.04	.24		10		.25	1.50
1:12		.16			4:22		1.33		
	03		.04	.80		05		.07	.84
1:15		.20			4:27		1.40		
	17		.01	.04		09		.09	.60
1:32		.21			4:36		1.49		
	02		.03	.90		02		.04	1.20
1:34		.24			4:38		1.53		
	25		.08	.19		04		.02	.30
1:59		.32			4:42		1.55		
	35		.14	.24		10		.07	.42
2:34		.46			4:52		1.62		
	03		.04	.80		15		.02	.08
2:37		.50			5:07		1.64		
	10		.12	.72		25		.02	.05
2:47		.62			5:32		1.66		
	02		.03	.90		03		.08	1.60
2:49		.65			5:35		1.74		
	23		.15	.39		07		.06	.51
3:12		.80			5:42		1.80		
	13		.08	.37		05		.03	.36
3:25		.88			5:47		1.83		
	04		.06	.90					
3:29		.94							
	10		.04	.24					

WATERSHED	2-L	3-L
Area (acres)	1.03	.85
Preceding Rain (in.)	.14	.14
date began	11/30	11/30
duration (hours)	9.33	9.33
Temperature (max. & min.)	57-38	57-38
Soil (major type)	Colby Silty Clay Loam	
percent of area	100	100
Slope, average (percent)	5-6	5-7
maximum	6	7
Cover, type	Wheat	Corn
height (ft.)	.05'	4'
date last cultivated	9/26/33	7/5/33
Soil loss (tons per acre)	None	.075

Remarks: Wheat plants now give little protection. The ground is bare between the drill rows.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H BENNETT, CHIEF,

HAYS, KANSAS

STORM No..... December 1, 1933

Plot by S.A.M. date 8-4-39 checked by [illegible] date Oct. 1939

Computations by S.A.M. date 8-4-39 checked by [illegible] date Oct. 1939

Sheet 1 of 1 Sheet

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH January February & March, 1934

SHEET 1 OF 6 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12368

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			1934.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	
Jan. 3			U. S. WEATHER BUREAU			.06	Standard	Gage		26	16	No	Runoff						2-L. Terraced Area. Colby silt clay loam. Average land slope 5 to 6%. Vertical spacing 4'. Grade constant 4". Wheat harvested 6/22. Plowed with one-way disc 7/2. Blank listed 7/14.
4			do	do	do	.17	do		do	29	22	do		do					
6			do	do	do	.06	do		do	37	29	do		do					
Febr. 10			do	do	do	T	do		do	40	25	do		do					3-L. Terraced Area. Colby silt clay loam. Average land slope 5 to 7%. Vertical spacing 4'. Grade constant 4". Seeded to Barley 3/22. Corn stalks cut 3/22. Barley harvested 6/22. Plowed by one-way disc 7/2. Blank listed and basined 7/14. Lister ridges curled in 9/7. Plowed by one-way disc 9/12. Subsoil packed 9/12. Seeded to wheat 9/27.
11			do	do	do	.30	do		do	33	26	do		do					
17			do	do	do	.11	do		do	53	34	do		do					
18			do	do	do	.18	do		do	47	17	do		do					
21			do	do	do	.25	do		do	39	19	do		do					
22			do	do	do	.03	do		do	24	11	do		do					4-L. Terraced Area. Colby silt clay loam. Average land slope 6 to 8%. Vertical spacing 4'. Grade constant 4". Lister ridges curled in 5/25. Plowed by one-way disc 5/25. Subsoil packed 5/25. Planted to corn 6/9. Corn cultivated 6/28. Corn crop a failure less than 2 bushel per acre.
23			do	do	do	.02	do		do	32	16	do		do					
24			do	do	do	.10	do		do	30	14	do		do					
25			do	do	do	.17	do		do	14	4	do		do					
26			do	do	do	T	do		do	12	-6	do		do					
Mar. 4			do	do	do	T	do		do	63	30	do		do					
7			do	do	do	.25	do		do	60	23	do		do					
24			do	do	do	.10	do		do	37	16	do		do					

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH March, April May & June, 1934

SHEET 2 OF 6 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12368

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Mar. 30			U. S. WEATHER BUREAU			.10	Standard		Gage	44	21	No		Runoff					2-N. Terraced Area. Colby silt clay loam. Average land slope 3 to 7%. Vertical spacing 2'. Grade constant level. Wheat harvested 6/23. Blank listed and basined 7/17. Lister ridges curled in 9/7. Plowed by one-way disc 9/8. Subsoil packed 9/8. Seeded to wheat 9/28.
Apr. 1			do	do	do	.06	do		do	68	37	do		do					
4			do	do	do	.05	do		do	50	43	do		do					
5			do	do	do	T	do		do	51	30	do		do					
6			do	do	do	T	do		do	63	38	do		do					3-N. Terraced Area. Colby silt clay loam. Average land slope 3 to 7%. Vertical spacing 3'. Grade constant level. Wheat harvested 6/23. Blank listed and basined 7/14. Lister ridges curled in 9/7. Plowed by one-way disc 9/8. Subsoil packed 9/8. Seeded to wheat 9/28.
15			2-L	7:47A	178	.11	.24	.08	.06	63	39	do		do					
17			2-I.	7:00A	195	.26	.24	.16	.12	62	46	do		do					
30			2-L	9:15P	30	.03	.36	.28	.16	91	55	do		do					
May 2			2-L	7:48A	112	.18	.72	.32	.28	77	60	do		do					1.61 AG. Pasture Area. Colby silt clay loam. Average land slope 5 to 8%. Cover of native buffalo and gramma grass. No grazing except by cattle during the growing season. Not over grazed at any time.
4			2-L	3:10A	980	.36	2.16	.80	.40	71	61	do		do					
12			2-L	7:30P	570	.51	1.56	.64	.36	94	64	do		do					
14			2-I.	2:22A	338	.12	.24	.12	.08	60	44	do		do					
28			2-L	--	--	.03	--	--	--	103	61	do		do					6-L. Cultivated Area. Colby silt clay loam. Average land slope. Wheat harvested 6/22. Blank listed and basined 7/17. Lister ridges curled in 9/7. Plowed by one-way disc 9/12. Subsoil packed 9/12. Seeded to wheat 9/27.
June 2			2-L	2:42A	3	.02	--	--	--	94	62	do		do					
4			2-L	8:45A	20	.04	.24	.12	.08	94	62	do		do					
7			2-I.	9:45P	25	.37	2.16	1.20		101	75	do		do					

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Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

MONTH JUNE, 19 34

PROJECT HAYS, KANSAS

SHEET 3 OF 6 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12388

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
June 10			2-L	6:30A	15	.16	1.44	.64		93	61	No	Runoff						
13			2-L	8:10A	150	.32	.24	.20	.20	88	63	do		do					
15*	2-L	1.03	2-L	12:01A	539	1.12	4.20	1.88	1.12	87	59	1:16A	6:08A	.320	.40	4:55A	.80	.10	
*	3-L	.85	2-L	do	do	1.12	do	do	do	do	do	1:16A	5:58A	.260	.49	4:54A	.86	.23	
*	4-L	.87	2-L	do	do	1.12	do	do	do	do	do	1:16A	6:14A	.280	.61	4:57A	.84	.76	
*	2-N	2.81	3-N	do	do	1.05	do	do	do	do	do	4:44A	5:11A	.012	.08	4:47A	1.04	.0	
*	3-N	2.95	3-N	do	do	1.05	do	do	do	do	do	1:12A	5:56A	.022	.12	4:59A	1.03	.0	
*	6-L	2.81	2-L	do	do	1.12	do	do	do	do	do	1:18A	5:39A	.060	.42	4:52A	1.06	.04	
*	1.61AG	1.61	U. S.	WEATHER	BUREAU	1.49	Standard	Gage		do	do	1:10A	5:42A	.272	.99	1:17A	1.22	.01	
15*	2-L	1.03	2-L	10:02P	92	.49	2.04	1.30	.77	87	59	10:20P	12:28A	.159	.22	10:33P	.33	.03	
*	3-L	.85	2-L	do	do	.49	do	do	do	do	do	10:22P	11:22P	.136	.21	10:35P	.35	.04	
*	4-L	.87	2-L	do	do	.49	do	do	do	do	do	10:18P	11:35P	.144	.30	10:26P	.35	.13	
*	2-N	2.81	3-N	do	do	.52	do	do	do	do	do	10:18P	10:35P	.008	.10	10:20P	.51	.0	
*	3-N	2.95	3-N	do	do	.52	do	do	do	do	do	10:13P	11:53P	.025	.16	10:20P	.49	.0	
*	6-L	2.81	2-L	do	do	.49	do	do	do	do	do	10:17P	11:20P	.078	.82	10:26P	.41	.05	
*	1.61AG	1.61	U. S.	WEATHER	BUREAU	.48	Standard	Gage		do	do	10:38P	11:04P	.003	.01	10:40P	.48	.0	
16*	2-L	1.03	2-L	10:18P	57	1.12	3.12	2.27	1.96	82	62	10:31P	12:19A	.845	1.84	10:52P	.27	.35**	
*	3-L	.85	2-L	do	do	1.12	do	do	do	do	do	10:24P	12:20A	.839	1.57	10:40P	.28	.61**	
*	4-L	.87	2-L	do	do	1.12	do	do	do	do	do	10:27P	12:17A	.841	2.01	10:51P	.28	2.04**	
*	2-N	2.81	3-N	do	do	1.43	do	do	do	do	do	10:32P	1:03A	.183	1.27	10:43P	1.25	.10**	
*	3-N	2.95	3-N	do	do	1.43	do	do	do	do	do	10:29P	1:25A	.184	1.31	10:44P	1.25	.07**	
*	6-L	2.81	2-L	do	do	1.12	do	do	do	do	do	10:25P	11:50P	.483	4.50	10:46P	.64	.40**	
*	1.61AG	1.61	U. S.	WEATHER	BUREAU	1.21	Standard	Gage		do	do	10:30P	11:47P	.429	2.22	10:50P	.78	.04**	
19			2-L	8:55P	15	.08	.60	.32		102	68	No	Runoff						
22	4-L	.87	2-L	1:15A	33	.39	1.56	1.00	.71	94	60	1:27A	2:34A	.078	.14	1:51A	.31	None	
28			2-L	--	--	.01	--	--	--	101	74	no runoff		no runoff					
29			2-L	--	--	.02	--	--	--	104	74	do		do					

* Hydrographs plotted for these storms.

**Includes soil not previously measured from the June 15 and 16 rains.

Form S. C

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June

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH June, July, August, 1934

SHEET 4 OF 6 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 8—12303

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	MAXIMUM RATE Cu. ft. sec.	MAXIMUM RATE Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
June 30			2-L	--	--	.03	--	--	--	93	68	No	Runoff						
July 5			2-L	2:15P	23	.05	.48	.20		90	68	do		do					
10-11			2-L	6:45P	407	.32	.84	.52	.28	110	70	do		do					
18			2-L	--	--	.02	--	--	--	108	70	do		do					
27			2-L	--	--	.02	--	--	--	93	63	do		do					
31			2-L	5:20P	15	.03	--	--	--	116	69	do		do					
Aug. 12			2-L	5:35P	55	.34	.96	.80	.48	107	71	do		do					
13			2-L	2:50A	40	.08	--	--	--	94	67	do		do					
14			2-L	--	--	.01	--	--	--	104	69	do		do					
16			2-L	12:57A	143	.30	1.08	.52	.26	93	70	do		do					
17			2-L	1:10A	230	.26	.72	.32	.26	97	70	do		do					
17			2-L	10:55P	5	.02	.24	--	--	97	70	do		do					
23			2-L	2:52P	78	.14	.24	.20	.20	92	60	do		do					
24			2-L	--	--	.04	--	--	--	68	51	do		do					
30*	4-L	.87	2-L	5:35A	95	1.06	3.60	2.06	1.44	95	68	6:00A	7:28A	.321	.59	6:13A	.74	.26	
*	6-L	2.81	2-L	do	do	1.06	do	do	do	do	do	5:57A	6:32A	.104	1.50	6:04A	.96	.10	
*1.61AG		1.61	U. S. WEATHER BUREAU			1.05	Standard	Gage		do	do	6:00A	6:52A	.063	.35	6:12A	.99	.01	
												No Runoff on other watersheds.							

* Hydrographs plotted for these storms.

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June

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month August, September, October, November, 1934

Project HAYS, KANSAS

Sheet 5 of 6 sheets

U. S. GOVERNMENT PRINTING OFFICE 8—12369

Date	Watershed		Rainfall							Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
							Maximum Intensity								Maximum Rate				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Aug. 31*	4-L	.87	2-L	6:35P	140	.80	1.78	1.42	.99	93	68	6:51P	9:49P	.354	.32	7:12P	.45	.33	
*	6-L	2.81	2-L	do	do	do	do	do	do	do	do	6:50P	9:20P	.185	.99	7:00P	.61	.34	
*1.61AG		1.61	U. S. WEATHER BUREAU			.71	Standard Gage			do	do	7:59P	8:50P	.011	.05	8:13P	.70	.0	
Sept. 1			2-L	3:15A	165	.14	.12	.12	.12	79	64	No Runoff							
2			2-L	1:15P	240	.26	.48	.20	.16	70	64	do		do					
9			2-L	10:00A	260	.21	.48	.24	.22	73	62	do		do					
14			2-L	12:23A	127	.30	.96	.52	.42	86	63	do		do					
24			2-L	3:55A	50	.18	.48	.32	.26	86	69	do		do					
25			2-L	7:23P	167	.32	1.68	.64	.36	77	55	do		do					
28			2-L	7:50P	160	.25	.72	.48	.34	79	49	do		do					
Oct. 6			2-L	--	--	.03	--	--	--	81	44	do		do					
17			2-L	10:50A	350	.40	.24	.16	.14	72	52	do		do					
Nov. 2			2-L	8:35P	485	.32	.24	.20	.18	73	41	do		do					
17			U. S. WEATHER BUREAU			.09	Standard Gage			64	54	do		do					
27			do	do	do	.17	do		do	47	32	do		do					
28			do	do	do	.06	do		do	33	30	do		do					

* Hydrographs plotted for these storms.

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Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month November & December, 19 34

Project HAYS, KANSAS

Sheet 6 of 6 sheets

U. S. GOVERNMENT PRINTING OFFICE 8—12348

Date	Watershed		Rainfall							Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	Maximum Intensity: 5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate: Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Nov. 29			U. S.	WEATHER	BUREAU	.13	Standard Gage			37	22	No	Runoff						
Dec. 2			do	do	do	.02	do		do	30	20	do		do					
25			do	do	do	T	do		do	46	15	do		do					

Form S. C.

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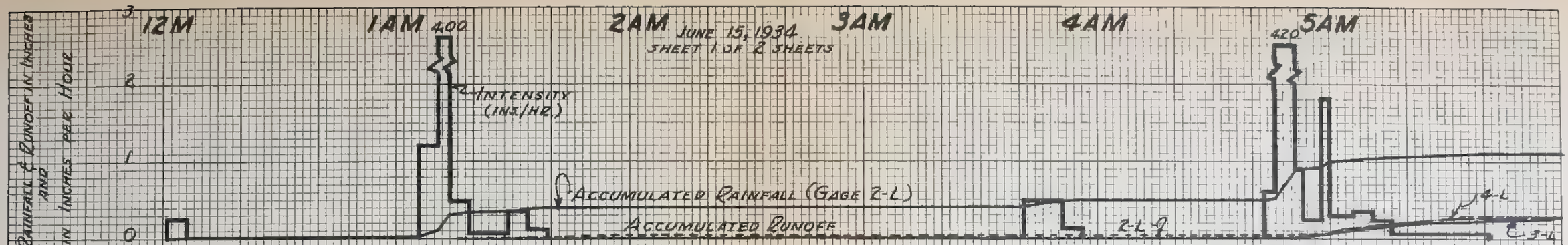
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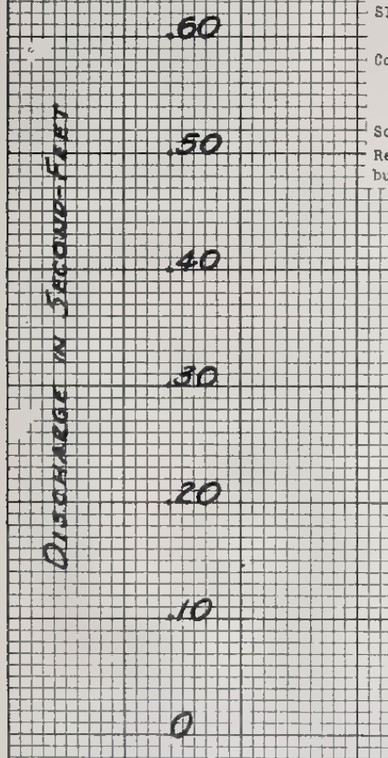


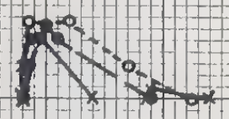
Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.32	.32	.32
date began	6/13	6/13	6/13
duration (hours)	2.50	2.50	2.50
Temperature (max. & min.)	87 & 59	87 & 59	87 & 59
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Wheat	Barley	Corn
height (ft.)	0 to .5	0 to .3	0
date last cultivated	9/26	3/22	6/9
Soil loss (tons per acre)	.10*	.23*	.76*

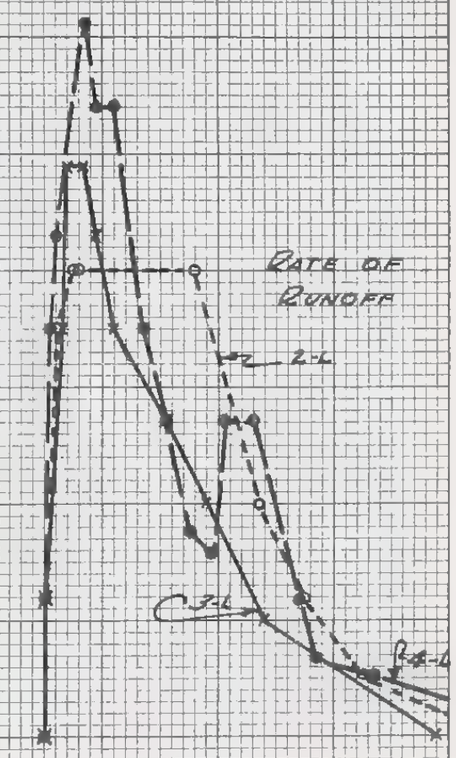
Remarks: *Soil in silt box not recorded this rain but is recorded June 16.

GAGE 2-L

(1) TIME	(2) (Hr.) (Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
12:01A		.0		
	05		.02	.24
12:06		.02		
	1 00		.0	.0
1:06		.02		
	05		.10	1.20
1:11		.12		
	03		.20	4.00
1:14		.32		
	05		.04	.48
1:19		.36		
	10		.01	.06
1:29		.37		
	05		.03	.36
1:34		.40		
	05		.01	.12
1:39		.41		
	2 02		.0	.0
3:41		.41		
	10		.08	.48
3:51		.49		
	05		.01	.12
3:56		.50		
	47		.0	.0
4:43		.50		
	03		.03	.60
4:46		.53		
	05		.35	4.20
4:51		.88		
	02		.03	.90
4:53		.91		
	05		.02	.24
4:58		.93		
	02		.06	1.80
5:00		.99		
	06		.03	.30
5:06		1.02		
	05		.03	.36
5:11		1.05		
	05		.02	.24
5:16		1.07		
	25		.03	.07
5:41		1.10		
	1 55		.0	.0
7:36		1.10		
	1 24		.02	.02
9:00		1.12		







UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF,
HAYS, KANSAS

STORM NO June 15, 1934 AM

Plot by S.A.M. date 6-39. checked by S.A.M. & D.R.D. date 12-15-39
Computations by A.M.M. date 8-39 checked by S.A.M. & D.R.D. date 12-15-39

Sheet 1 of 6 sheets.

Form S. C

PROJECT

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DATE

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Dec.

JUNE 15, 1934
SHEET 2 OF 2 SHEETS

6AM 7AM 8AM 9AM

ACCUMULATED RAINFALL AND RUNOFF IN INCHES
AND
RAINFALL IN INCHES PER HOUR

3
2
1
0

ACCUMULATED RAINFALL (GAGE 2-L)

INTENSITY (INS/HR.)

R2-L
L-4-L

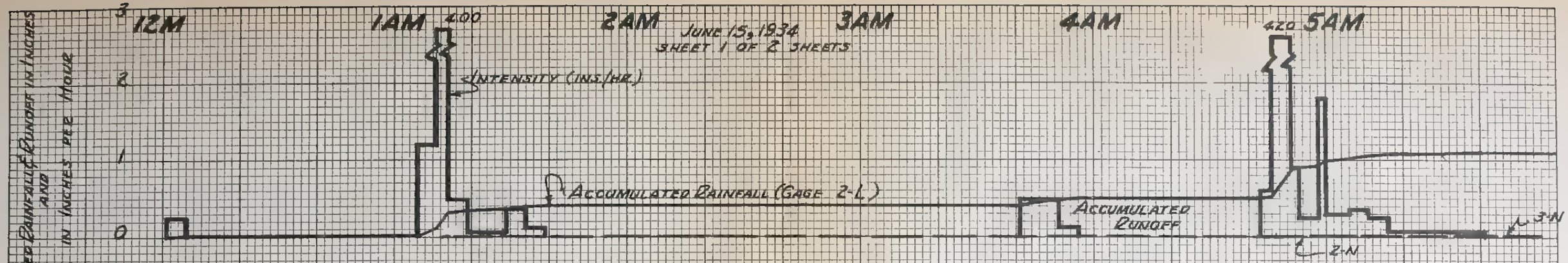
DISCHARGE IN SECOND-FEET

40
30
20
10
0

RATE OF RUNOFF

A-L
R2-L

HAYS, KANSAS
June 15, 1934 AM
Sheet 2 of 0 sheets



Watershed	2-N	3-N
Area (acres)	2.81	2.95
Preceding Rain (in.)	.30	.30
date began	6/13	6/13
duration (hours)	2.50°	2.50°
Temperature (max. & min.)	87 & 59	87 & 59
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	Wheat	Wheat
height (ft.)	0 to .5	0 to .5
date last cultivated	9/26	9/25
Soil loss (tons per acre)	°°	°°

Remarks: °Record taken from 2-L recording rain gage believed to be about the same. °°Soil in silt box not recorded this rain but is recorded June 16.

GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
12:01A		0		
	05		.02	.24
12:06		.02		
	1 00		0	0
1:06		.02		
	05		.10	1.20
1:11		.12		
	03		.20	4.00
1:14		.32		
	05		.04	.48
1:19		.36		
	10		.01	.06
1:29		.37		
	05		.03	.36
1:34		.40		
	05		.01	.12
1:39		.41		
	2 02		0	0
3:41		.41		
	10		.08	.48
3:51		.49		
	05		.01	.12
3:56		.50		
	47		0	0
4:43		.50		
	03		.03	.60
4:46		.53		
	05		.35	4.20
4:51		.88		
	02		.03	.90
4:53		.91		
	05		.02	.24
4:58		.93		
	02		.06	1.80
5:00		.99		
	06		.03	.30
5:06		1.02		
	05		.03	.36
5:11		1.05		
	05		.02	.24
5:16		1.07		
	25		.03	.07
5:41		1.10		
	1 55		0	0
7:36		1.10		
	1 24		.02	.02
9:00		1.12		

6AM 7AM 8AM 9AM

JUNE 15, 1934
SHEET 2 OF 2 SHEETS

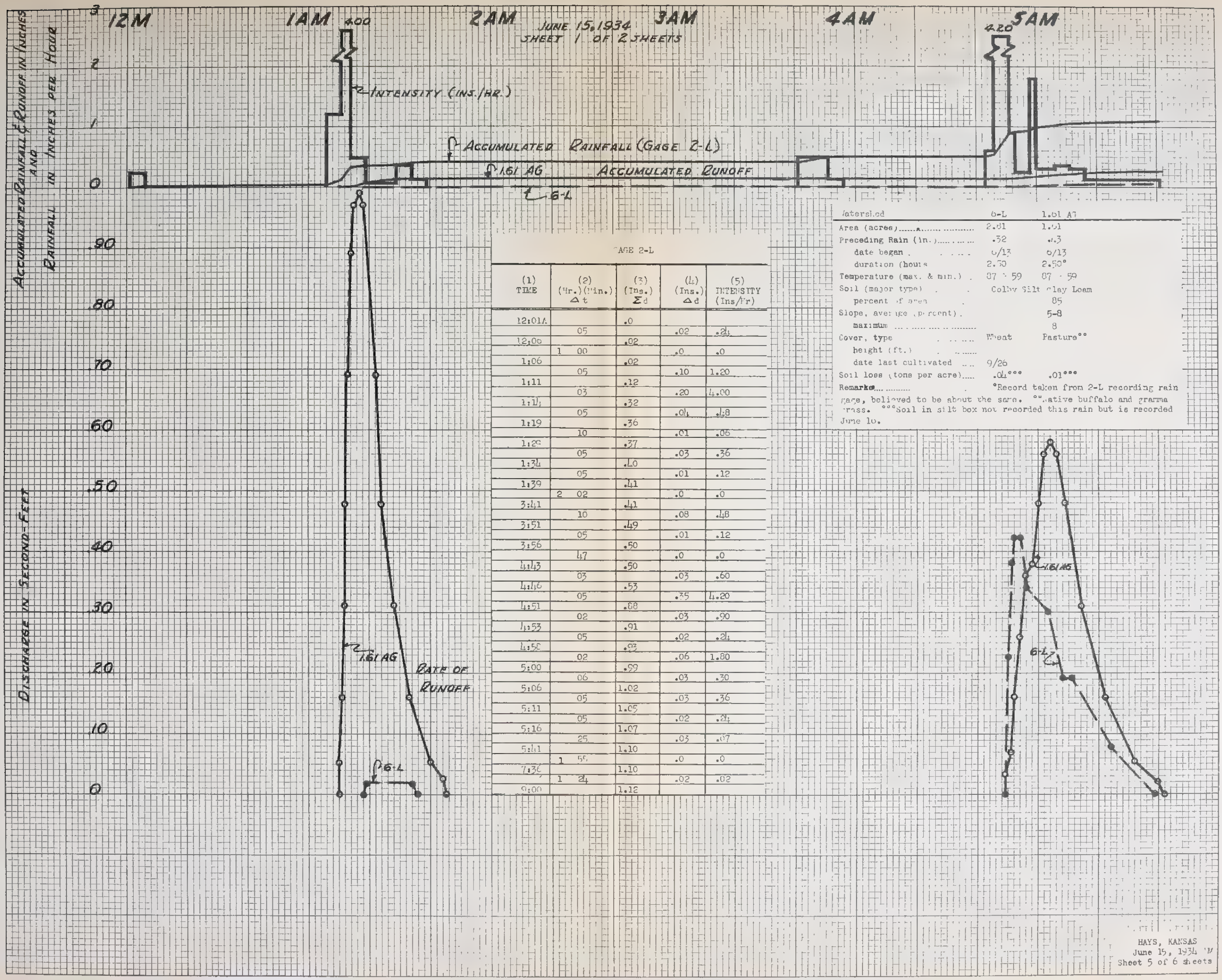
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

3
2
1
0

ACCUMULATED RAINFALL (GAGE 2-L)

INTENSITY (INS./HR.)

HAYS, KANSAS
June 15, 1934 AM
Sheet 4 of 6 sheets



PAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
12:01A		.0		
	05		.02	.24
12:06		.02		
	1 00		.0	.0
1:06		.02		
	05		.10	1.20
1:11		.12		
	03		.20	4.00
1:14		.32		
	05		.04	.48
1:19		.36		
	10		.01	.06
1:29		.37		
	05		.03	.36
1:34		.40		
	05		.01	.12
1:39		.41		
	2 02		.0	.0
3:41		.41		
	10		.08	.48
3:51		.49		
	05		.01	.12
3:56		.50		
	47		.0	.0
4:43		.50		
	03		.03	.60
4:46		.53		
	05		.35	4.20
4:51		.88		
	02		.03	.90
4:53		.91		
	05		.02	.24
4:58		.93		
	02		.06	1.80
5:00		.99		
	06		.03	.30
5:06		1.02		
	05		.03	.36
5:11		1.05		
	05		.02	.24
5:16		1.07		
	25		.03	.07
5:41		1.10		
	1 55		.0	.0
7:36		1.10		
	1 24		.02	.02
9:00		1.12		

Watershed	6-L	1.61 AG
Area (acres)	2.81	1.61
Preceding Rain (in.)	.32	.43
date began	6/13	6/13
duration (hours	2.30	2.50°
Temperature (max. & min.)	87 - 59	87 - 59
Soil (major type)	Colby Silt clay Loam	
percent of area		85
Slope, average (percent)		5-8
maximum		8
Cover, type	Wheat	Pasture°°
height (ft.)		
date last cultivated	9/26	
Soil loss (tons per acre)	.04°°°	.01°°°

Remarks: °Record taken from 2-L recording rain gage, believed to be about the same. °°Native buffalo and gramma grass. °°°Soil in silt box not recorded this rain but is recorded June 16.

6AM 7AM June 15, 1934 8AM 9AM

Sheet 2 of 8 sheets

Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour

3
2
1
0

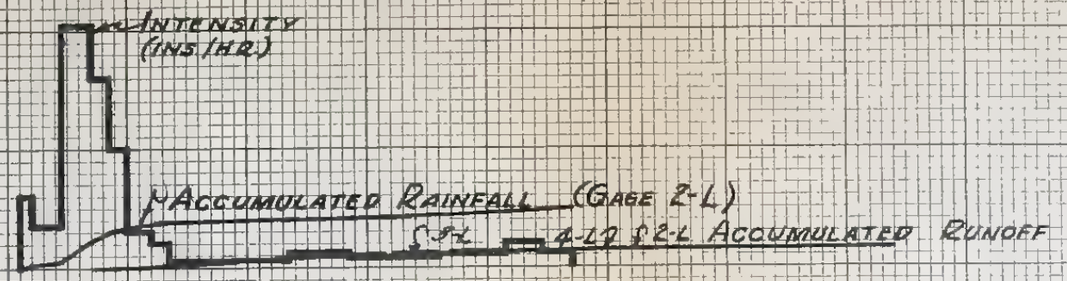
Accumulated Rainfall (Gage 2-L)

Intensity (Ins/Hr.)

HAYS, KANSAS
June 15, 1934 AM
Sheet 6 of 6 sheets

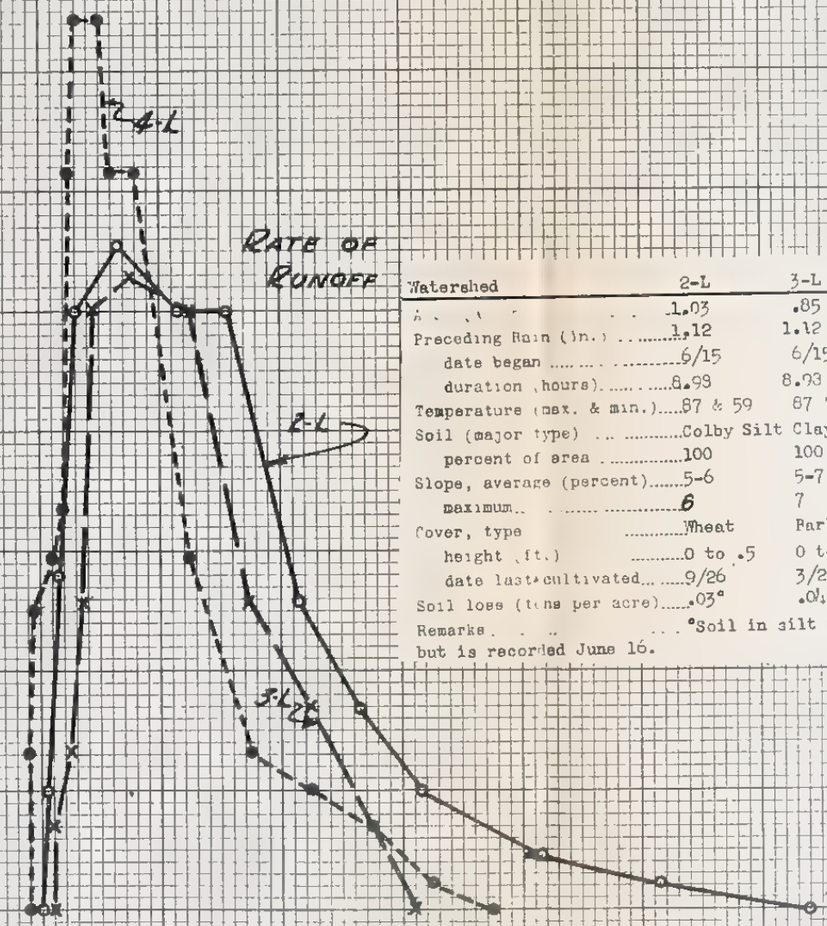
10PM 11PM 12M

June 15, 1934



Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour

Discharge in Second-Feet



Watershed	2-L	3-L	4-L
[illegible]	1.03	.85	.87
Preceding Rain (in.)	1.12	1.12	1.12
date began	6/15	6/15	6/15
duration (hours)	8.99	8.98	8.98
Temperature (max. & min.)	87 & 59	87 & 59	87 & 59
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Wheat	Barley	Corn
height (ft.)	0 to .5	0 to .3	0
date last cultivated	9/26	3/22	6/9
Soil loss (tons per acre)	.03*	.04*	.13*
Remarks	*Soil in silt box not recorded this rain but is recorded June 16.		

GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δ t	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (Ins/Hr)
10:02P		0		
	02		.02	.60
10:04		.02		
	05		.03	.36
10:09		.05		
	05		.17	2.04
10:14		.22		
	03		.08	1.60
10:17		.30		
	03		.05	1.00
10:20		.35		
	04		.02	.30
10:24		.37		
	03		.01	.20
10:27		.38		
	20		.02	.06
10:47		.40		
	10		.02	.12
10:57		.42		
	15		.02	.08
11:12		.44		
	11		.02	.11
11:23		.46		
	06		.02	.20
11:29		.48		
	05		.01	.12
11:34		.49		

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT CHIEF
HAYS, KANSAS

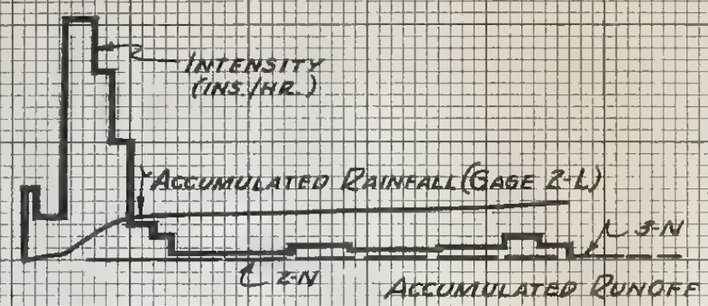
STORM NO. June 15, 1934 PM

Plot by LA-m date 1-39 checked by LA-m ARO date 12-15-39
Computations by LA-m date 1-39 checked by LA-m ARO date 2-15-39

Sheet 1 of 3 sheets.

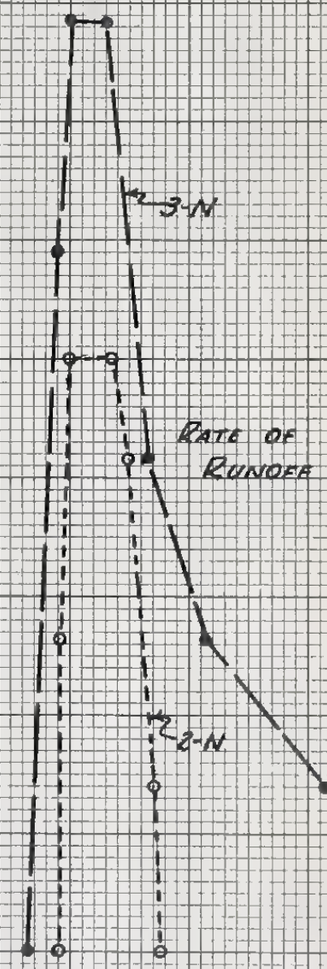
10PM 11PM 12M

JUNE 15, 1934



ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

DISCHARGE IN SECOND-FEET



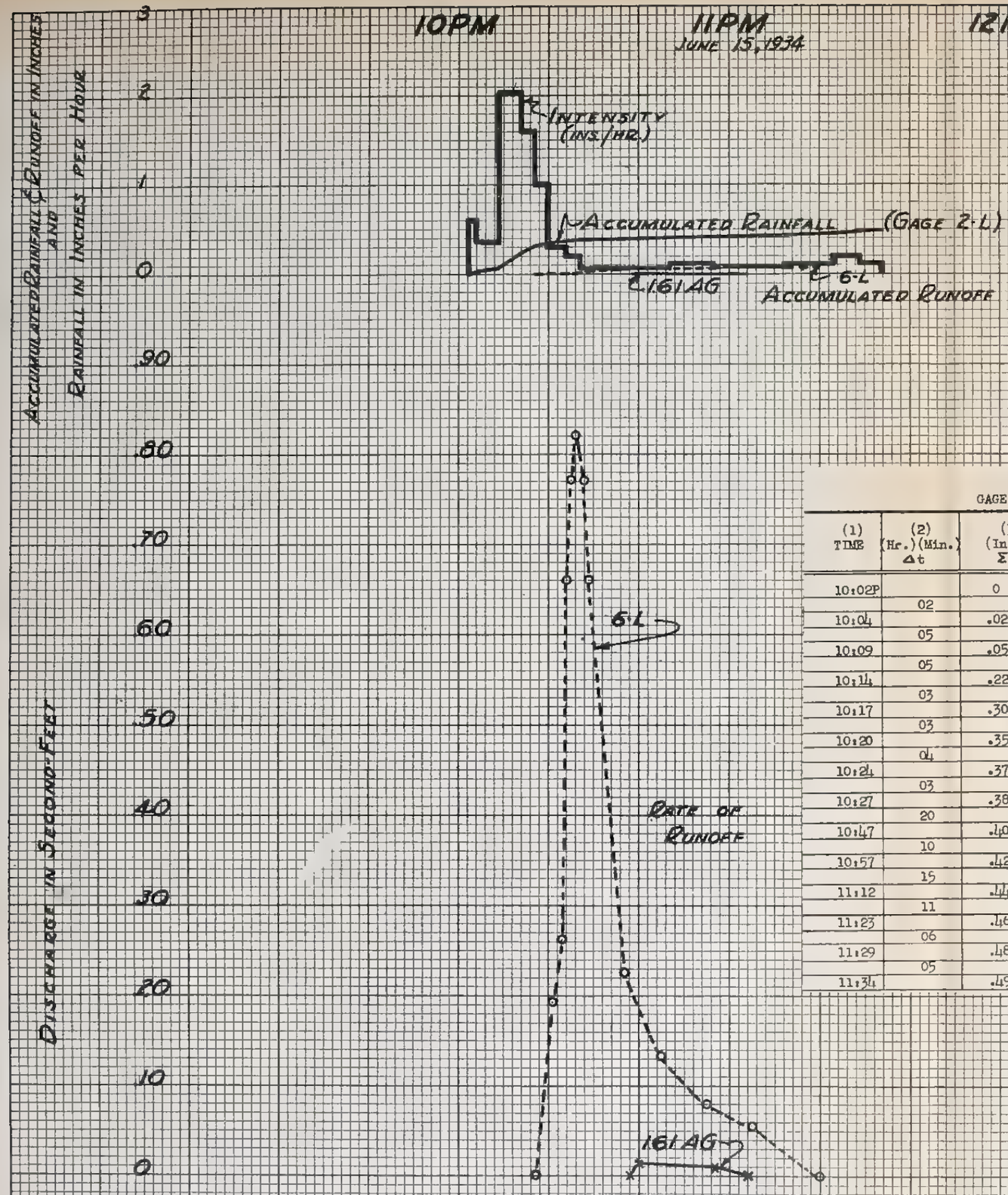
Watershed	2-N	3-N
Area (acres)	2.81	2.95
Preceding Rain (in.)	1.05	1.05
date began	6/15	6/15
duration (hours)	8.98°	8.98°
Temperature (max. & min.)	87 & 59	87 & 59
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	Wheat	Wheat
height (ft.)	0 to .5	0 to .3
date last cultivated	9/26	9/25
Soil loss (tons per acre)	°°	°°

Remarks °Record taken from 2-L recording rain gage, believed to be about the same. °°Soil in silt box not recorded this rain but is recorded June 16.

GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (Ins/Hr)
10:02P		0		
	02		.02	.60
10:04		.02		
	05		.03	.36
10:09		.05		
	05		.17	2.04
10:14		.22		
	03		.08	1.60
10:17		.30		
	03		.05	1.00
10:20		.35		
	04		.02	.30
10:24		.37		
	03		.01	.20
10:27		.38		
	20		.02	.06
10:47		.40		
	10		.02	.12
10:57		.42		
	15		.02	.08
11:12		.44		
	11		.02	.11
11:23		.46		
	06		.02	.20
11:29		.48		
	05		.01	.12
11:34		.49		

HAYS, KANSAS
June 15, 1934 PM
Sheet 2 of 3 sheets.



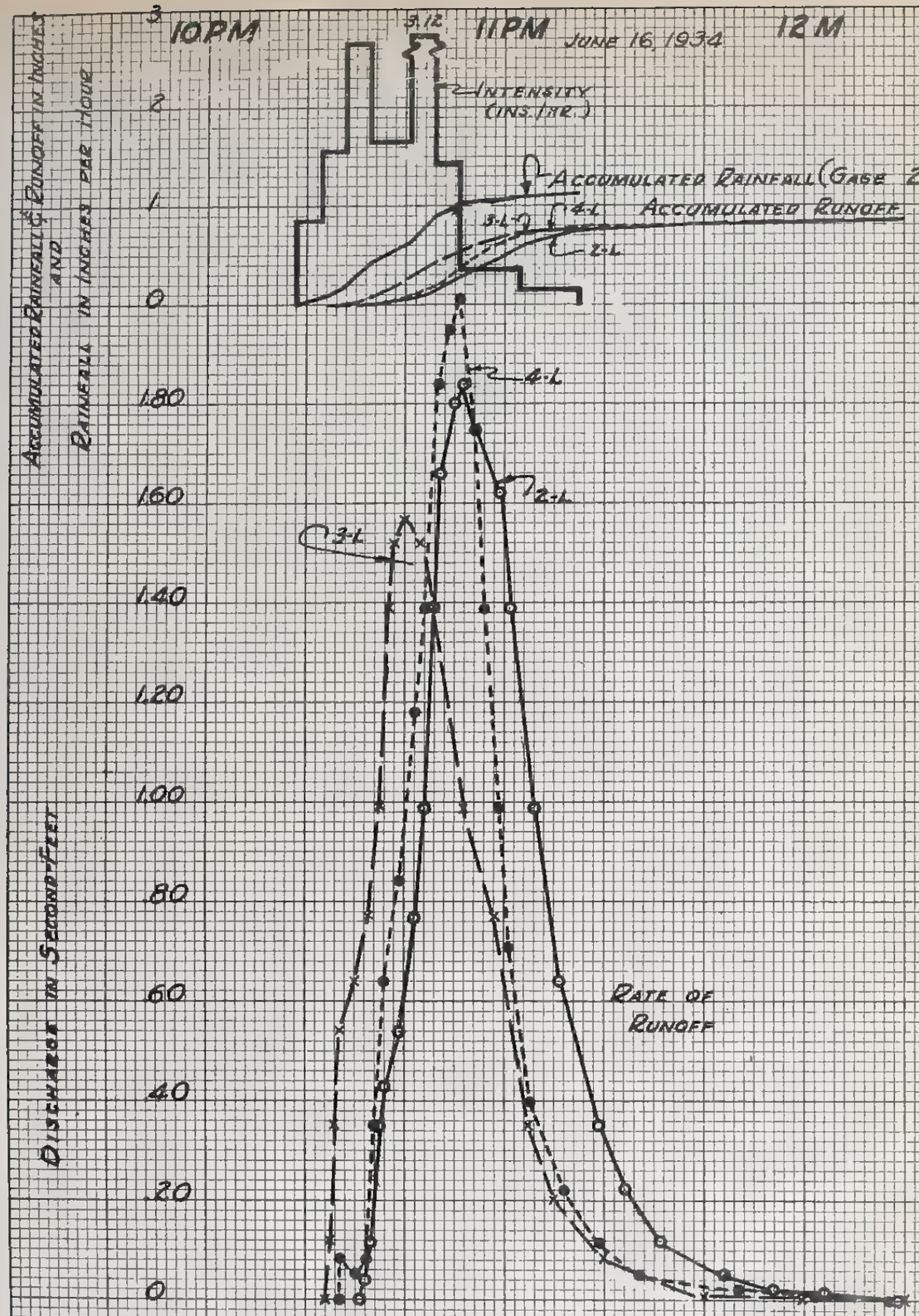
GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σ d	(4) (Ins.) Δ d	(5) INTENSITY (Ins/Hr)
10:02P		0		
	02		.02	.60
10:04		.02		
	05		.03	.36
10:09		.05		
	05		.17	2.04
10:14		.22		
	03		.08	1.60
10:17		.30		
	03		.05	1.00
10:20		.35		
	04		.02	.30
10:24		.37		
	03		.01	.20
10:27		.38		
	20		.02	.06
10:47		.40		
	10		.02	.12
10:57		.42		
	15		.02	.08
11:12		.44		
	11		.02	.11
11:23		.46		
	06		.02	.20
11:29		.48		
	05		.01	.12
11:34		.49		

Watershed	6-L	1.61 AG
Area (acres)	2.81	1.61
Preceding Rain (in.)	1.12	1.49
date began	6/15	6/15
duration (hours)	8.98°	8.98°
Temperature (max. & min.)	87 & 59	87 & 59
Soil (major type)	Colby Silt Clay Loam	
percent of area		85
Slope, average (percent)		5-8
maximum		8
Cover, type	Wheat	Pasture°°
height (ft.)	0 to .5	
date last cultivated	9/26	
Soil loss (tons per acre)	.05°°°	°°°

Remarks °Record taken from 2-L recording rain gage, believed to be about the same. °°Native buffalo and gramma grass, °°°Soil in silt box not recorded this rain but is recorded June 16.

HAYS, KANSAS
June 15, 1934 PM
Sheet 1 of 3 sheets.



Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding Rain (in.)	.49	.49	.49
date began	6/15	6/15	6/15
duration (hours)	1.53	1.53	1.53
Temperature (max. & min.)	82 & 62	82 & 62	82 & 62
Soil (major type)	Colby silt clay loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Wheat	Barley	Corn
height (ft.)	0 to .5	0 to .3	0
date last cultivated	9/26	3/22	6/9
Soil loss (tons per acre)	.35°	.61°	2.04°
Remarks	°Includes soil loss not recorded for rains		
of June 15 A. M. and P. M.			

GAGE 2-L

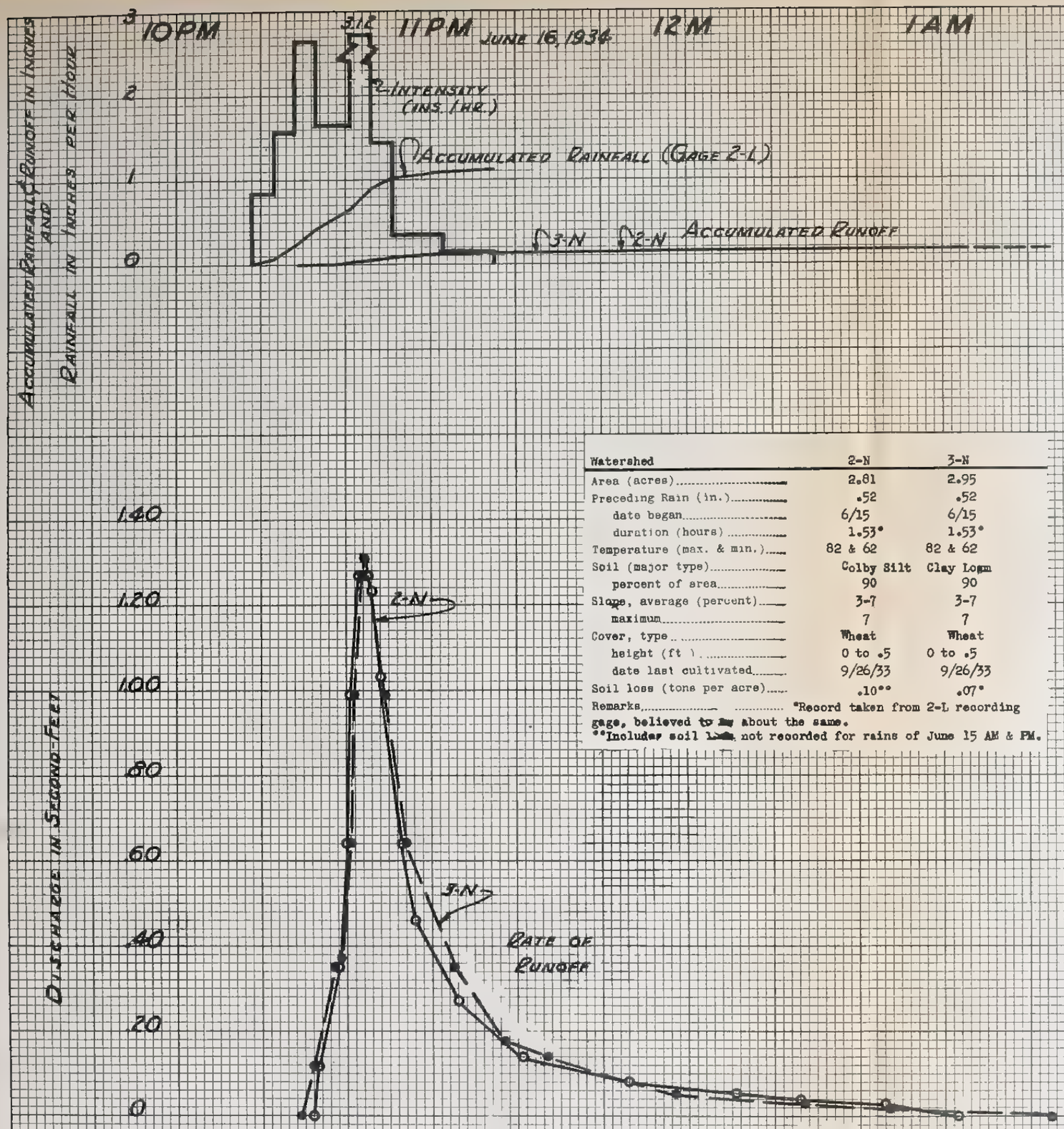
(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
10:18P		0		
	05		.07	.84
10:23		.07		
	05		.13	1.56
10:28		.20		
	05		.22	2.64
10:33		.42		
	08		.22	1.65
10:41		.64		
	05		.26	3.12
10:46		.90		
	05		.12	1.44
10:51		1.02		
	12		.07	.35
11:03		1.09		
	12		.03	.15
11:15		1.12		

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF
HAYS, KANSAS

STORM NO. June 16, 1934

Plot by L.A.M. date 8-39 checked by L.A.M. date 12-15-39
Computations by L.A.M. date 8-39 checked by L.A.M. date 12-15-39

Sheet 1 of 3 sheets.



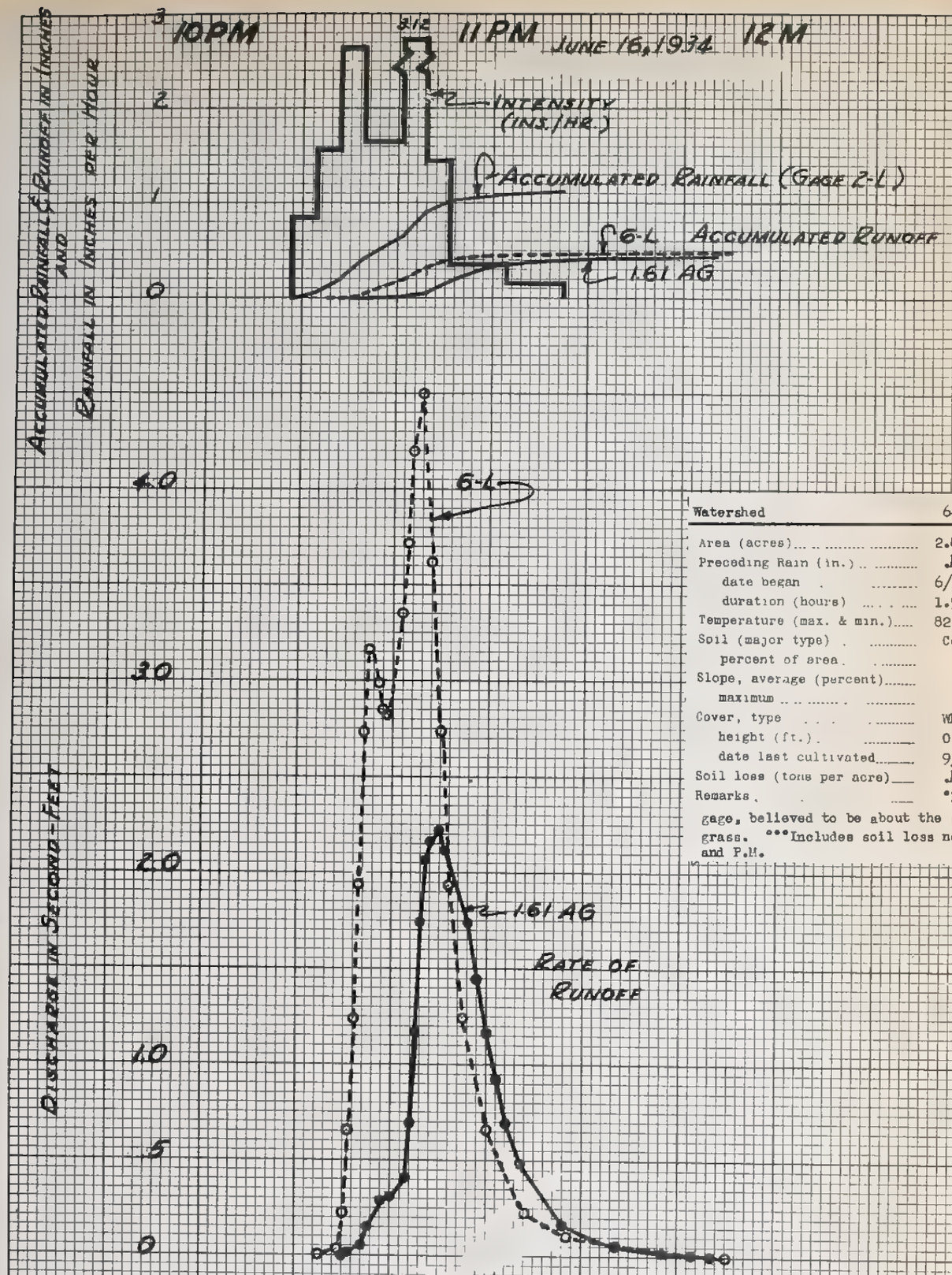
Watershed	2-N	3-N
Area (acres)	2.81	2.95
Preceding Rain (in.)	.52	.52
date began	6/15	6/15
duration (hours)	1.53*	1.53*
Temperature (max. & min.)	82 & 62	82 & 62
Soil (major type)	Colby Silt	Clay Loam
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	Wheat	Wheat
height (ft)	0 to .5	0 to .5
date last cultivated	9/26/33	9/26/33
Soil loss (tons per acre)	.10**	.07*

Remarks: *Record taken from 2-L recording gage, believed to be about the same.
**Includes soil loss not recorded for rains of June 15 AM & PM.

GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
10:18P		0		
	05		.07	.84
10:23		.07		
	05		.13	1.56
10:28		.20		
	05		.22	2.64
10:33		.42		
	08		.22	1.65
10:41		.64		
	05		.26	3.12
10:46		.90		
	05		.12	1.44
10:51		1.02		
	12		.07	.35
11:03		1.09		
	12		.03	.15
11:15		1.12		

HAYS, KANSAS
June 16, 1934

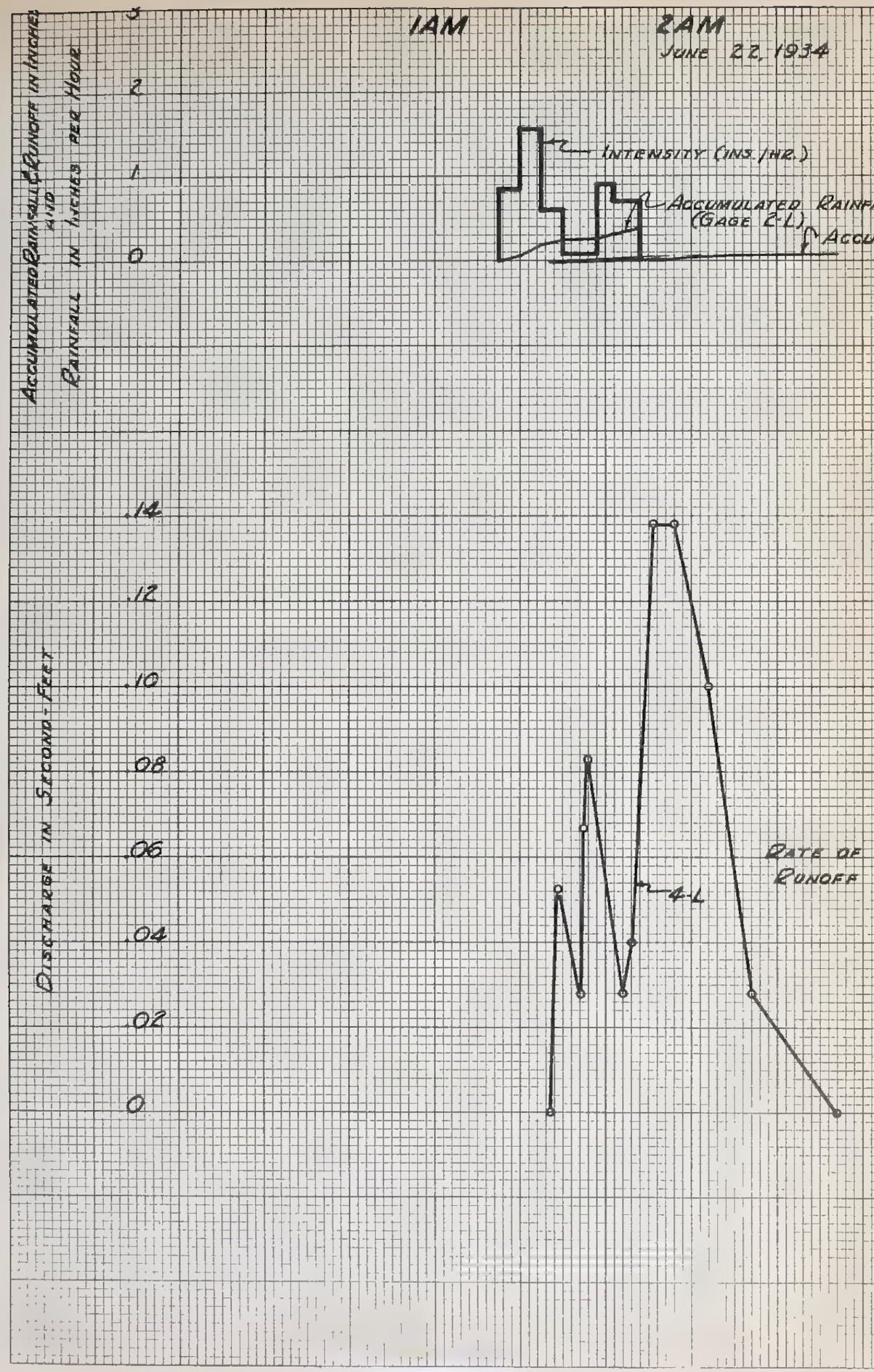


Watershed	6-L	1.61 AG
Area (acres)	2.81	1.61
Preceding Rain (in.)	.49	.48
date began	6/15	6/15
duration (hours)	1.53	1.53*
Temperature (max. & min.)	82 & 62	82 & 62
Soil (major type)	Colby Silt Clay Loam	
percent of area		85
Slope, average (percent)		5-8
maximum		8
Cover, type	Wheat	Pasture**
height (ft.)	0 to .5	
date last cultivated	9/26	
Soil loss (tons per acre)	.40***	.04***
Remarks	*Record taken from 2-L recording rain gage, believed to be about the same. **Native buffalo and gramma grass. ***Includes soil loss not recorded for rains of June 15 A.M. and P.M.	

GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
10:18P		0		
	05		.07	.84
10:23		.07		
	05		.13	1.56
10:28		.20		
	05		.22	2.64
10:33		.42		
	08		.22	1.65
10:41		.64		
	05		.26	3.12
10:46		.90		
	05		.12	1.44
10:51		1.02		
	12		.07	.35
11:03		1.09		
	12		.03	.15
11:15		1.12		

HAYS, KANSAS
June 16, 1934
Sheet 3 of 3 sheets.



GAGE 2-L

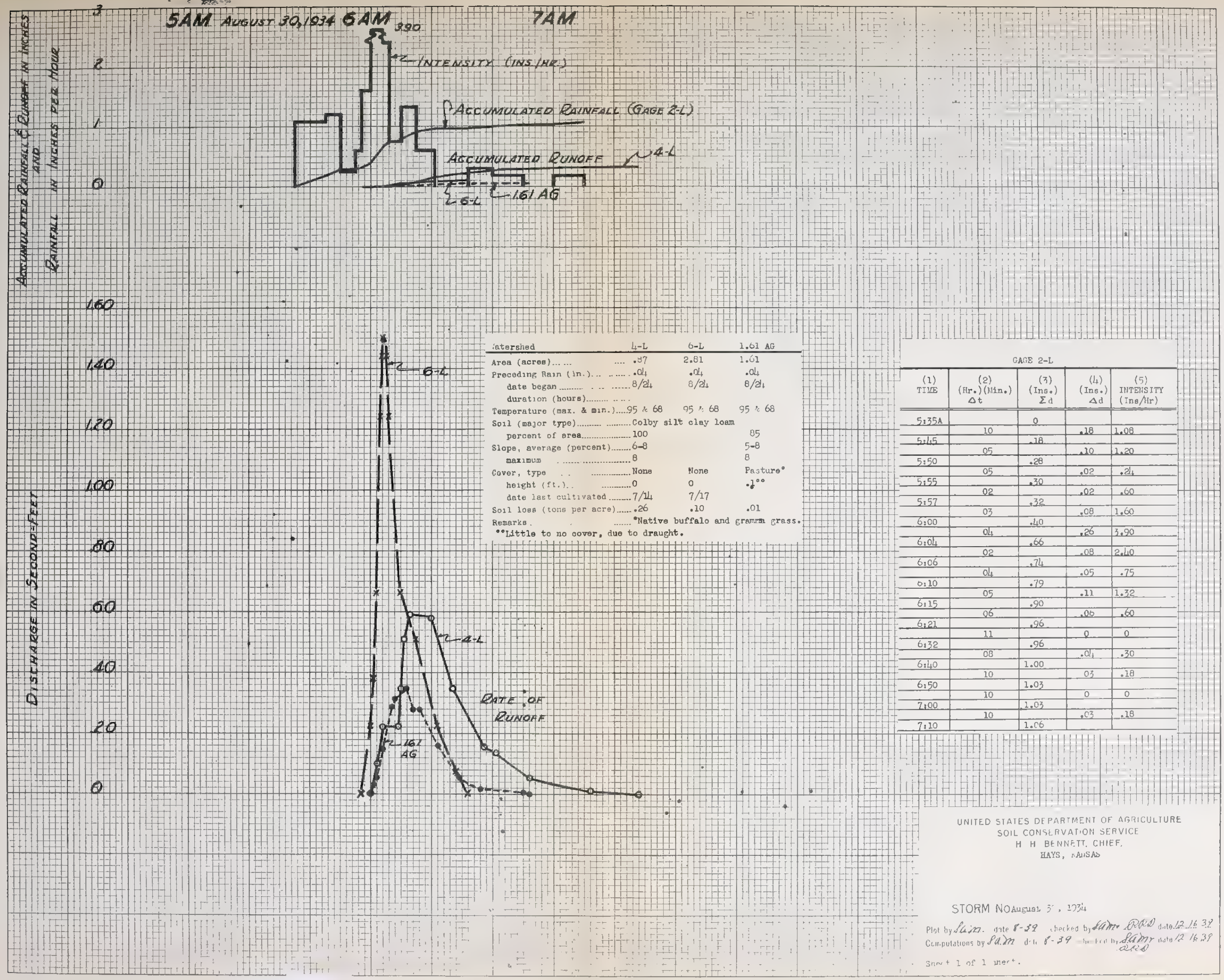
(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
1:15A		0		
	05		.07	.84
1:20		.07		
	05		.13	1.56
1:25		.20		
	05		.05	.60
1:30		.25		
	08		.01	.08
1:38		.26		
	04		.06	.90
1:42		.32		
	06		.07	.70
1:48		.39		

Watershed	4-L
Area (acres)	.87
Preceding Rain (in.)	.08
date began	6/19
duration (hours)	.25
Temperature (max. & min.)	94 & 60
Soil (major type)	Colby Silt Clay Loam
percent of area	100
Slope, average (percent)	6 - 8
maximum	8
Cover, type	Corn
height (ft.)	0
date last cultivated	6/9/34
Soil loss (tons per acre)	
Remarks	

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF,
HAYS, KANS.

STORM NO ..... June 22, 1934

Plot by L.A.M. date 8-3-9 checked by [illegible] date [illegible]
Computations by L.A.M. date 8-34 checked by [illegible] date [illegible]
Sheet 1 of 1 sheet



Watershed	4-L	6-L	1.61 AG
Area (acres)	.87	2.81	1.61
Preceding Rain (in.)	.04	.04	.04
date began	8/24	8/24	8/24
duration (hours)			
Temperature (max. & min.)	95 & 68	95 & 68	95 & 68
Soil (major type)	Colby silt clay loam		
percent of area	100		85
Slope, average (percent)	6-8		5-8
maximum	8		8
Cover, type	None	None	Pasture*
height (ft.)	0	0	.4**
date last cultivated	7/14	7/17	
Soil loss (tons per acre)	.26	.10	.01

Remarks: *Native buffalo and gramma grass.
**Little to no cover, due to draught.

GAGE 2-L

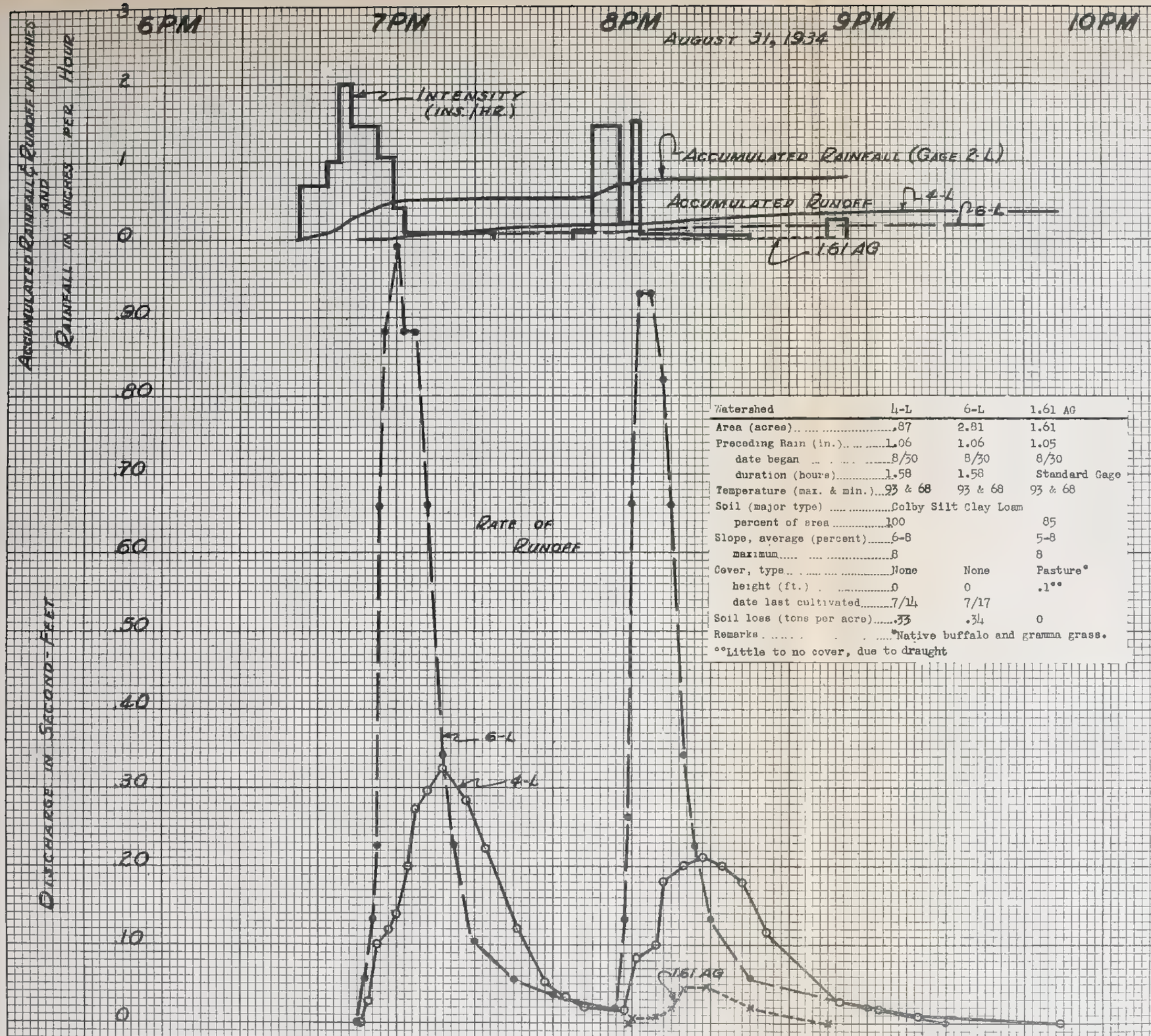
(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
5:35A		0		
	10		.18	1.08
5:45		.18		
	05		.10	1.20
5:50		.28		
	05		.02	.24
5:55		.30		
	02		.02	.60
5:57		.32		
	03		.08	1.60
6:00		.40		
	04		.26	3.90
6:04		.66		
	02		.08	2.40
6:06		.74		
	04		.05	.75
6:10		.79		
	05		.11	1.32
6:15		.90		
	06		.06	.60
6:21		.96		
	11		0	0
6:32		.96		
	08		.04	.30
6:40		1.00		
	10		03	.18
6:50		1.03		
	10		0	0
7:00		1.03		
	10		.03	.18
7:10		1.06		

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT, CHIEF,
HAYS, KANSAS

STORM NO August 30, 1934

Plot by Sam. date 8-39 checked by Sam. date 12-16-39
Computations by Sam. date 8-39 checked by Sam. date 12-16-39

Sheet 1 of 1 sheets.



Watershed	4-L	6-L	1.61 AG
Area (acres)	.87	2.81	1.61
Preceding Rain (in.)	1.06	1.06	1.05
date began	8/30	8/30	8/30
duration (hours)	1.58	1.58	Standard Gage
Temperature (max. & min.)	93 & 68	93 & 68	93 & 68
Soil (major type)	Colby Silt Clay Loam		
percent of area	100		85
Slope, average (percent)	6-8		5-8
maximum	8		8
Cover, type	None	None	Pasture*
height (ft.)	0	0	.1**
date last cultivated	7/14	7/17	
Soil loss (tons per acre)	.33	.34	0
Remarks	*Native buffalo and gramma grass.		

**Little to no cover, due to draught

GAGE 2-L

(1) TIME	(2) (Hr.)(Min.) Δt	(3) (Ins.) Σd	(4) (Ins.) Δd	(5) INTENSITY (Ins/Hr)
6:35P		0		
	07		.08	.68
6:42		.08		
	03		.05	1.00
6:45		.13		
	03		.10	2.00
6:48		.23		
	07		.17	1.45
6:55		.40		
	04		.07	1.05
6:59		.47		
	03		.02	.40
7:02		.49		
	23		.03	.08
7:25		.52		
	20		0	0
7:45		.52		
	05		.01	.12
7:50		.53		
	07		.17	1.45
7:57		.70		
	03		.01	.20
8:00		.71		
	02		.05	1.50
8:02		.76		
	13		.01	.05
8:15		.77		
	15		.01	.04
8:30		.78		
	20		0	0
8:50		.78		
	05		.02	.24
8:55		.80		

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H H BENNETT CHIEF.
HAYS, KANSAS

STORM NO. August 31, 1934

Plot by S.A.M. date 8-39 checked by S.A.M. - R.R.P. date 12-13-39
Computations by S.A.M. date 8-39 checked by S.A.M. - R.R.P. date 12-13-39
Sheet 1 of 1 sheet.

1935

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month: January, February, March, April, 1935

Locality: HAYS, KANSAS

Sheet 1 of 7 sheets

Date	Time Begin	Time End	Rainfall				Maximum Intensity			Temperature Degrees F		Runoff					Rainfall Minus Intercept Inches	Silt Loss tons per acre	Condition of Watershed
			Inches	Hours	Minutes	Average Inches	5 minutes Inches per hour	15 minutes Inches per hour	30 minutes Inches per hour	Maximum	Minimum	Total Inches	Rate Inches per hour	Average Inches	Maximum Rate Per Cent	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Jan. 7			T.	Weather Bureau		T	Standard Gage			49	31	No Runoff							2-L. Terra ed Area. Colby silt clay loam. Average land slope 5 to 7%. Vertical spacing 4'. Grade constant 4". Terrace length 700 feet. Lister ridges split by blank listing 1/19. Lister ridges smoothed by spring tooth harrow 5/23. Planted to pink kafir 6/20. Kafir cultivated 7/8. Kafir cultivated 7/26. Kafir harvested in October.
13			do	do	do	T	do	do	do	59	40	do	do						
14			do	do	do	T	do	do	do	51	31	do	do						
19			do	do	do	T	do	do	do	39	7	do	do						
20			do	do	do	T	do	do	do	9	-5	do	do						
Feb. 7			do	do	do	.06	do	do	do	30	27	do	do						
15			do	do	do	.11	do	do	do	45	32	do	do						3-L. Terraced Area. Colby silt clay loam. Average land slope 5 to 7%. Vertical spacing 4'. Grade constant 4". Terrace length 700 feet. Wheat harvested 7/15. Blank listed and basined 7/19.
16			do	do	do	.07	do	do	do	37	25	do	do						
24			do	do	do	.04	do	do	do	63	10	do	do						
25			do	do	do	T	do	do	do	21	8	do	do						4-L. Terraced area. Colby silt clay loam. Average land slope 6 to 8%. Vertical spacing 4'. Grade constant 4". Terrace length 700 feet. Plowed by one-way disc 4/29. Seeded to barley 4/29. Barley harvested 7/17. Blank listed and basined 7/19. Lister ridges curled in 9/10. Plowed by one-way disc 9/14. Subsoil packed 9/14. Plowed by one-way disc 10/4. Subsoil packed 10/4. Seeded to wheat 10/4.
Mar. 4			do	do	do	.15	do	do	do	58	39	do	do						
6			do	do	do	T	do	do	do	43	19	do	do						
Apr. 6			do	do	do	T	do	do	do	49	36	do	do						
7			do	do	do	.11	do	do	do	50	30	do	do						
9			do	do	do	.07	do	do	do	67	41	do	do						
10			do	do	do	T	do	do	do	57	42	do	do						

Form S C S-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH April, May, 1935

SHEET 2 OF 7 SHEETS

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE Degrees F		RUNOFF					RAINFALL MINUS RUNOFF Inches	SOIL LOSS tons per acre	REMARKS - Watersheds
	Number	Area acres	Gage No.	Began hour	Duration minutes	Amount inches	5 minutes inches per hour	15 minutes inches per hour	30 minutes inches per hour	Maximum	Minimum	Began hour	Ended hour	Amount inches	MAXIMUM RATE Cu ft sec	MAXIMUM RATE Time			
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19
Apr.16			do	do	do	.03	do		do	65	41	do	do						2-N. Terraced Area.
																			Colby silt clay loam.
23			U.S. Weather Bureau			T	Standard Gage			81	56	No Runoff							Average land slope 3 to 7%.
																			Vertical spacing 2 feet.
																			Grade constant level.
30			do	do	do	T	do		do	63	45	do		do					Terrace length 1600 feet.
																			Wheat harvested 7/15.
																			Plowed by one-way disc 7/17.
May 2			do	do	do	T	do		do	76	46	do		do					Plowed by one-way disc 9/12.
																			Subsoil packed 9/12.
																			Plowed by one-way disc 10/5.
7			do	do	do	.03	do		do	76	53	do		do					Seeded to wheat 10/7.
8			do	do	do	T	do		do	73	53	do		do					3-N Terraced Area.
																			Colby silt clay loam.
																			Average land slope 3 to 7%.
11			do	do	do	.47	do		do	91	60	do		do					Vertical spacing 3'.
																			Grade constant level.
																			Terrace length 1600 feet.
																			Wheat harvested 7/15.
13	2-L	1.03	2-L	10:15A	645	1.93	1.80	1.24	.83	54	47	---	---	.078	estimated		1.85		Plowed by one-way disc 7/17.
*	3-L	.85	2-L	do	do	1.93	do	do	do	do	do	11:05A	3:08P	.216	0.14	11:23A	1.71	0	Plowed by one-way disc 9/12.
*	4-L	.87	2-L	do	do	1.93	do	do	do	do	do	11:08A	2:52P	.125	0.09	11:15A	1.80	.14	Subsoil packed 9/12.
	2-N	2.81	3-Na	do	do	1.91	do	do	do	do	do	No Runoff			---	---	1.91		Plowed by one-way disc 10/5.
	3-N	2.95	3-Na	do	do	1.91	do	do	do	do	do	No Runoff			---	---	1.91		Seeded to wheat 10/7.
	6-L	2.85	2-L	do	do	1.93	do	do	do	do	do	---	---	.439-estimated			1.49		
*	1.61AG	1.61	U. S. Weather Bureau			2.18	Standard Gage			do	do	11:06A	8:54P	.291	0.61	3:02P	2.04	.14	
																			1.61 AG. Pasture Area.
																			Colby silt clay loam.
14			2-L	3:40P	355	.16	.24	.16	.10	54	44	No Runoff			---	---	.16		Average land slope 3 to 3%.
																			Cover of native buffalo and
																			gramma grass.
17-18	2-L	1.03	2-L	1:14P	1990	2.04	1.08	.57	.46	60	49	No Runoff			---	---	2.04		No grazing except by cattle
	3-L	.85	2-L	do	do	2.04	do	do	do	do	do	do		do	---	---	2.04		during the growing season.
	4-L	.87	2-L	do	do	2.04	do	do	do	do	do	do		do	---	---	2.04		Not over grazed at any time.
	2-N	2.81	3-Na	do	do	1.25	do	do	do	do	do	do		do	---	---	1.25		
	3-N	2.95	3-Na	do	do	1.25	do	do	do	do	do	do		do	---	---	1.25		
	6-L	2.85	2-L	do	do	2.04	do	do	do	do	do	do		do	---	---	2.04		
*	1.61AG	1.61	U.S. Weather Bureau			2.36	Standard Gage			do	do	17.41A	10:50P[b]	.194	0.71	10:05P	2.36	.13	
21			U.S. Weather Bureau			.24	Standard Gage			69	48	No Runoff			---	---	.24		

a-Average value of Gages 3-N and "Control Plot"

b- May 16.

* Hydrographs plotted for these storms.

Form S.C.S.-183

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month May, June 1935

Project HAYS, KANSAS

Sheet 3 of 7 sheets

Date	Watershed: Number	Watershed: Area (acres)	Rainfall: Gage No.	Rainfall: Began (hour)	Rainfall: Duration (minutes)	Rainfall: Amount (inches)	Rainfall: Maximum Intensity: 5 minutes (inches per hour)	Rainfall: Maximum Intensity: 15 minutes (inches per hour)	Rainfall: Maximum Intensity: 30 minutes (inches per hour)	Temperature (degrees F): Maximum	Temperature (degrees F): Minimum	Run-off: Began (hour)	Run-off: Ended (hour)	Run-off: Amount (inches)	Run-off: Maximum Rate: Cu. ft. per sec.	Run-off: Maximum Rate: Time	Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Remarks & Watershed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(14)	(14)	(15)	(16)	(17)	(18)	(19)
May 22			U.S. Weather Bureau			.02	Standard Gage			67	50	No	Runoff		---	---	.02		6-L. Cultivated Area. Colby silt clay loam. Average land slope.
23			U.S. Weather Bureau			.02	Standard Gage			63	43	No	Runoff		---	---	.02		Wheat harvested 7/15. Plowed by one-way disc 7/20.
27			2-L	2:35A	55	.18	.36	.24	.18	77	59	No	Runoff		---	---	.18		Plowed by one-way disc 9/14. Subsoil packed 9/14.
27			2-L	5:08P	138	.26	.96	.60	.46	77	59	No	Runoff		---	---	.26		Plowed by one-way disc 10/4. Subsoil packed 10/4. Seeded to wheat 10/4.
31			2-L	3:12A	30	.07	.24	.14	.14	85	62	No	Runoff		---	---	.07		
31			2-L	5:40P	70	.07	.24	.16	.12	85	62	No	Runoff		---	---	.07		
June 1*	2-L	1.03	2-L	5:03A	172	1.00	3.96	2.52	1.52	85	62	5:18A	6:45A	.17	0.37	5:32A	.85	.12	
*	3-L	.85	2-L	do	do	1.00	do	do	do	do	do	5:17A	8:42A	.46	0.92	5:28A	.56	.18	
*	4-L	.87	2-L	do	do	1.00	do	do	do	do	do	5:09A	8:33A	.52	1.48	5:32A	.50	.23	
*	2-N	2.81	3-N	do	do	.98	do	do	do	do	do	5:22A	7:58A	.04	.33	5:28A	.94	.01	
*	3-N	2.95	3-N	do	do	.96	do	do	do	do	do	5:16A	8:29A	.09	.40	5:30A	.89	.01	
*	6-L	2.85	2-L	do	do	1.00	do	do	do	do	do	5:12A	8:50A	.72	8.82	5:29A	.30	.50	
*	1.61AG	1.61	U.S. Weather Bureau			.98	Standard Gage			do	do	5:06A	8:04A	.61	3.39	5:22A	.37	.55	
1*	2-L	1.03	2-L	4:37P	53	.30	1.60	.97	.59	83	62	4:50P	6:16P	.071	0.18	5:06P	.23	.06	
*	3-L	.85	2-L	do	do	.30	do	do	do	do	do	4:49P	6:08P	.159	0.31	5:06P	.14	.06	
*	4-L	.87	2-L	do	do	.30	do	do	do	do	do	4:46P	6:10P	.170	0.26	5:07P	.13	.07	
*	2-N	2.81	3-Na	do	do	.44	do	do	do	do	do	4:53P	5:16P	.018	0.28	5:00P	.42	0	
*	3-N	2.95	3-Na	do	do	.44	do	do	do	do	do	4:48P	5:56P	.046	0.23	5:01P	.39	.01	
*	6-L	2.85	2-L	do	do	.30	do	do	do	do	do	4:46P	6:03P	.172	2.65	5:00P	.13	.15	
	1.61AG	1.61	U.S. Weather Bureau			T	Standard Gage			do	do	No	Runoff		---	---	---		
3			2-L	12:45A	105	.08	.24	.16	.10	75	53	No	Runoff		---	---	.08		
4			2-L	---	---	.04	---	---	---	71	54	No	Runoff		---	---	.04		
5			2-L	---	---	.07	---	---	---	81	50	No	Runoff		---	---	.07		

*-Hydrographs plotted for these storms. a-Average value of Gages 3-N and "Control Plot".

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH June, July, 1935

SHEET 4 OF 7 SHEETS

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SOIL LOSS (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19
June 10			2-L	---	---	.02				92	70								
12			2-L	12:40A	245	.29	.36	.28	.24	84	61	No	Runoff		---	---	.29		
12			2-L	---	---	.04	---	---	---	84	61	No	Runoff		---	---	.04		
16-17	2-L	1.03	2-L	6:15A	930	1.13	.96	.67	.45	76	61	No	Runoff		---	---	1.13		
	3-L	.85	2-L	do	do	1.13	do	do	do	do	do	No	Runoff		---	---	1.13		
	4-L	.87	2-L	do	do	1.13	do	do	do	do	do	No	Runoff		---	---	1.13		
	2-N	2.81	3-N	do	do	1.23	do	do	do	do	do	No	Runoff		---	---	1.23		
*	3-N	2.95	3-N	do	do	1.23	do	do	do	do	do	8:12A	5:43P	.067	0.08	9:10A	1.16	0	
	6-L	2.05	2-L	do	do	1.13	do	do	do	do	do	No	Runoff		---	---	1.13		
*	1.61AG	1.61	U.S. Weather Bureau			1.12	Standard Gage			do	do	8:25A	4:24P	.312	0.89	2:39P	.81	.03	
25	2-L	1.03	2-L	12:50P	87	.58	1.32	1.10	.85	89	61	No	Runoff		---	---	.58		
	3-L	.85	2-L	do	do	.58	do	do	do	do	do	No	Runoff		---	---	.58		
*	4-L	.87	2-L	do	do	.58	do	do	do	do	do	1:08A	2:47A	.044	0.06	1:18A	.54	0	
	2-N	2.81	3-N	do	do	.64	do	do	do	do	do	No	Runoff		---	---	.64		
	3-N	2.95	3-N	do	do	.64	do	do	do	do	do	No	Runoff		---	---	.64		
	6-L	2.05	2-L	do	do	.58	do	do	do	do	do	No	Runoff		---	---	.58		
*	1.61AG	1.61	U.S. Weather Bureau			.69	Standard Gage			do	do	1:10A	2:03A	.094	0.34	1:25A	.60	.01	
25-26	2-L	1.03	2-L	11:07P	185	.66	2.76	1.08	.60	89	61	12:05A	2:10A	.043	0.16	12:23A	.62	0	
*	3-L	.85	2-L	do	do	.66	do	do	do	do	do	11:08P	1:13A	.049	0.16	12:29A	.57	.03	
	4-L	.87	2-L	do	do	.66	do	do	do	do	do	11:12P	1:20A	.052	0.22	12:12A	.57	.03	
	2-N	2.81	3-N	do	do	.71	do	do	do	do	do	[illegible]	[illegible]	[illegible]	[illegible]	---	.71		
	3-N	2.95	3-N	do	do	.71	do	do	do	do	do	12:02A	[illegible]	[illegible]	[illegible]	12:23A	.63	0	
	6-L	2.05	2-L	do	do	.66	do	do	do	do	do	11:11P	[illegible]	[illegible]	[illegible]	12:23A	.58	0	
*	1.61AG	1.61	U.S. Weather Bureau			.81	Standard Gage			do	do	11:00P	[illegible]	[illegible]	[illegible]	12:[illegible]	.76	.07	
	2-L		2-L			.15						12:01A	[illegible]	[illegible]	[illegible]	12:23A	.08	0	
	3-L		2-L			.76						12:09A	1:47A	.08	[illegible]	12:[illegible]	.53	.03	
	4-L		2-L			.15						12:13A	2:15A	.08	0.08	12:44A	.38	.03	
	2-N		3-N			.15						12:05A	1:15A	.08	0.33	12:23A	.13	0	
	3-N		3-N	do	do	.15	do	do	do	do	do	12:02A	1:15A	.08	0.37	12:17A	.13	.01	
	6-L		2-L	do	do	.15	do	do	do	do	do	12:10A	1:28A	.13	0.32	12:17A	.13	.01	
*	1.61AG	1.61	U.S. Weather Bureau			.10	Standard Gage			do	do	12:07A	12:51A	.02	0.10	12:21A	.04	0	

*-Hydrographs plotted for these storms.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Project HAYS, KANSAS

Month August, September, October, November, 1935

Date	Watershed		Rainfall				Maximum Intensity			Temperature (degrees F.)		Runoff					Rainfall Minus Runoff (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate Cu ft sec	Maximum Rate Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
June 30			2-L	5:58A	90	.09	.24	.20	.12	88	64	No	Runoff		---	---	.09		
July 23			2-L	1:27P	45	.05	.36	.16	.08	97	68	No	Runoff		---	---	.05		
Aug. 6			2-L	---	---	.02	---	---	---	101	74	---	---	---	---	---	.02		
18			2-L	---	---	.08	---	---	---	106	74	No	Runoff		---	---	.08		
19			2-L	9:10P	100	.62	1.08	.72	.50	105	71	No	Runoff		---	---	.62		
23			2-L	---	---	.02	---	---	---	94	70	---	---	---	---	---	.02		
24			2-L	2:30P	50	.40	1.56	.80	.44	97	69	No	Runoff	---	---	---	.40		
28			2-L	12:42P	473	.45	1.20	.56	.28	72	56	do	do						
Sept. 1			2-L	---	---	.07	---	---	---	68	59	do	do						
Sept.8-9			2-L	12:40P	840	1.17	1.68	1.48	.88	72	50	No	Runoff	---	---	---	1.17		
25-26a	2-L	1.03	2-L	4:33P	730	2.75	2.40	2.24	2.05	88	49	6:59Pa	1:05Ab	.723	1.66	8:00Pa	2.03	.62	
	3-L	.85	2-L	do	do	2.75	do	do	do	do	do	No	Runoff	---	---	---			
*	4-L	.87	2-L	do	do	2.75	do	do	do	do	do	7:34Pa	10:10Pa	.517	1.27	8:01Pa	2.23	.57	
*	2-M	2.81	3-M	do	do	2.16	do	do	do	do	do	7:56Pa	9:42Pa	.017	.27	8:05Pa	2.14	.03	
*	3-M	2.95	3-M	do	do	2.16	do	do	do	do	do	8:15Pa	10:46Pa	.026	.18	8:30Pa	2.13	.03	
*	6-L	2.85	2-L	do	do	2.75	do	do	do	do	do	7:45Pa	12:45Ab	1.127	10.60	8:05Pa	1.62	6.27	
*	1.61AG	1.61	U.S. Weather Bureau			3.36	Standard Gage			do	do	7:36Pa	8:54Pa	.717	2.29	8:12Pa	2.64	.04	
Oct.16-17			2-L	10:45P	390	.44	.36	.32	.30	79	48	No	Runoff		---	---			
19			U.S. Weather Bureau			.07	Standard Gage			78	40	No	Runoff		---	---			

a-September 25, 1935. b-September 26, 1935. *-Hydrographs prepared for these storms.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

PROJECT HAYS, KANSAS

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

MONTH November, December, 1935

	Watershed		Rainfall				Maximum Intensity			Temperature (degrees F.)		Runoff					Rainfall Minus Runoff	Soil Loss	Condition of Watershed
Date	Number	Area	Day No.	Hours	Duration	Amount	Duration	Maximum	Minimum	Maximum	Minimum	Hours	Ended	Amount	Maximum Rate				
															In S. Ac.	Time			
3																			
4			do	do	do	T	do		do	36	21	do	do						
10			do	do	do	.07	do		do	60	23	do	do						
11			do	do	do	.20	do		do	30	19	do	do						
12			do	do	do	T	do		do	51	7	do	do						
13			do	do	do	T	do		do	58	28	do	do						
14			do	do	do	.04	do		do	51	27	do	do						
15			do	do	do	.02	do		do	27	22	do	do						
16			do	do	do	T	do		do	29	26	do	do						
17			do	do	do	T	do		do	35	29	do	do						
18			do	do	do	T	do		do	50	33	do	do						
19			do	do	do	.22	do		do	54	36	do	do						
21			do	do	do	.11	do		do	42	32	do	do						

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

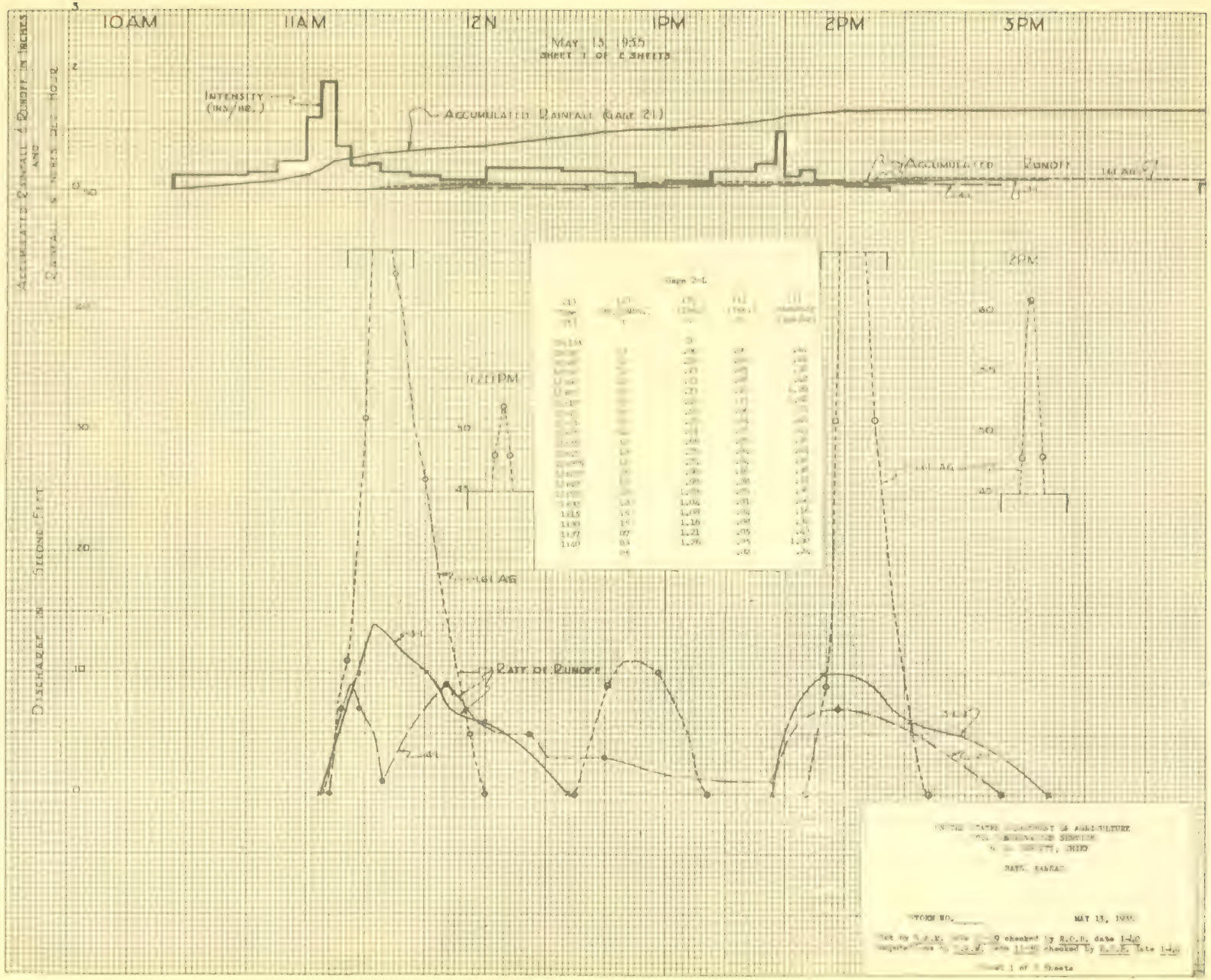
RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

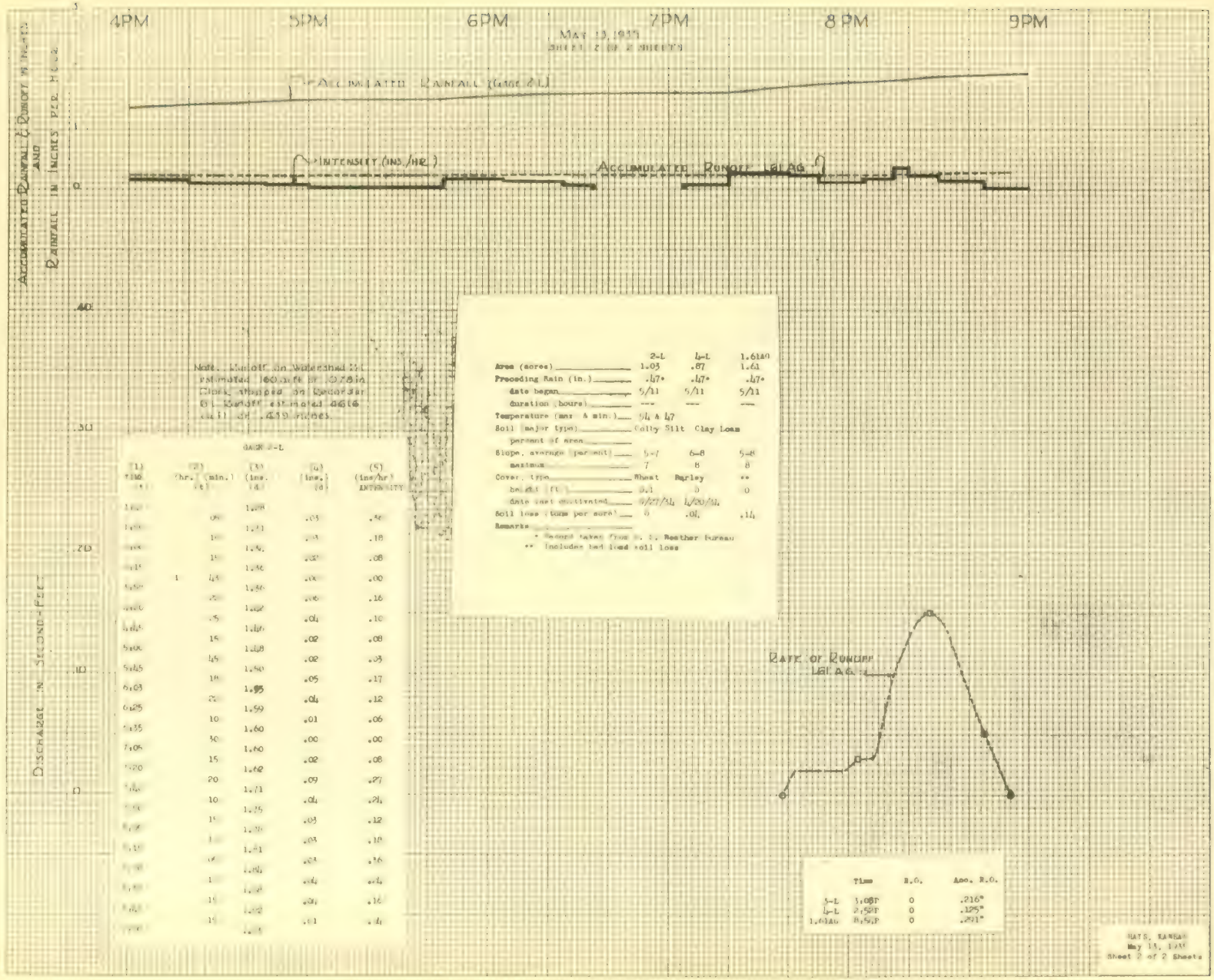
PROJECT HAYS, KANSAS

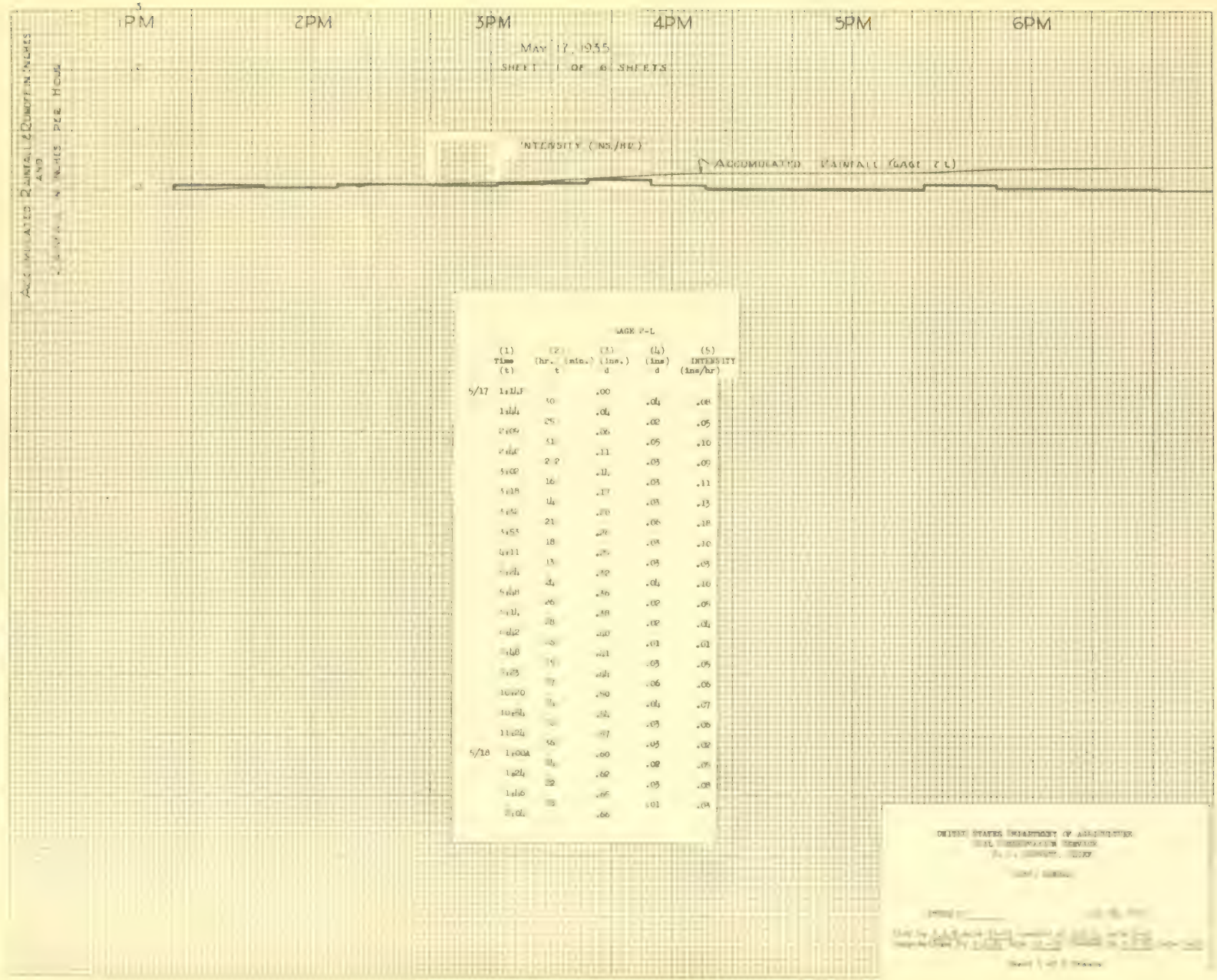
MONTH November, December, 19 35

SHEET 7 OF 7 SHEETS

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	MAXIMUM RATE Cu. ft. sec	MAXIMUM RATE Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Nov. 28			do	do	do	T	do	do		48	32	do	do						
Dec. 6			do	do	do	.06	do	do		57	37	do	do						
27			U.S. Weather Bureau			T	Standard Gage			28	21	No Runoff							
28			do	do	do	.05	do		do	44	22	do		do					
29			do	do	do	.07	do		do	45	20	do		do					
31			do	do	do	.02	do		do	36	33	do		do					

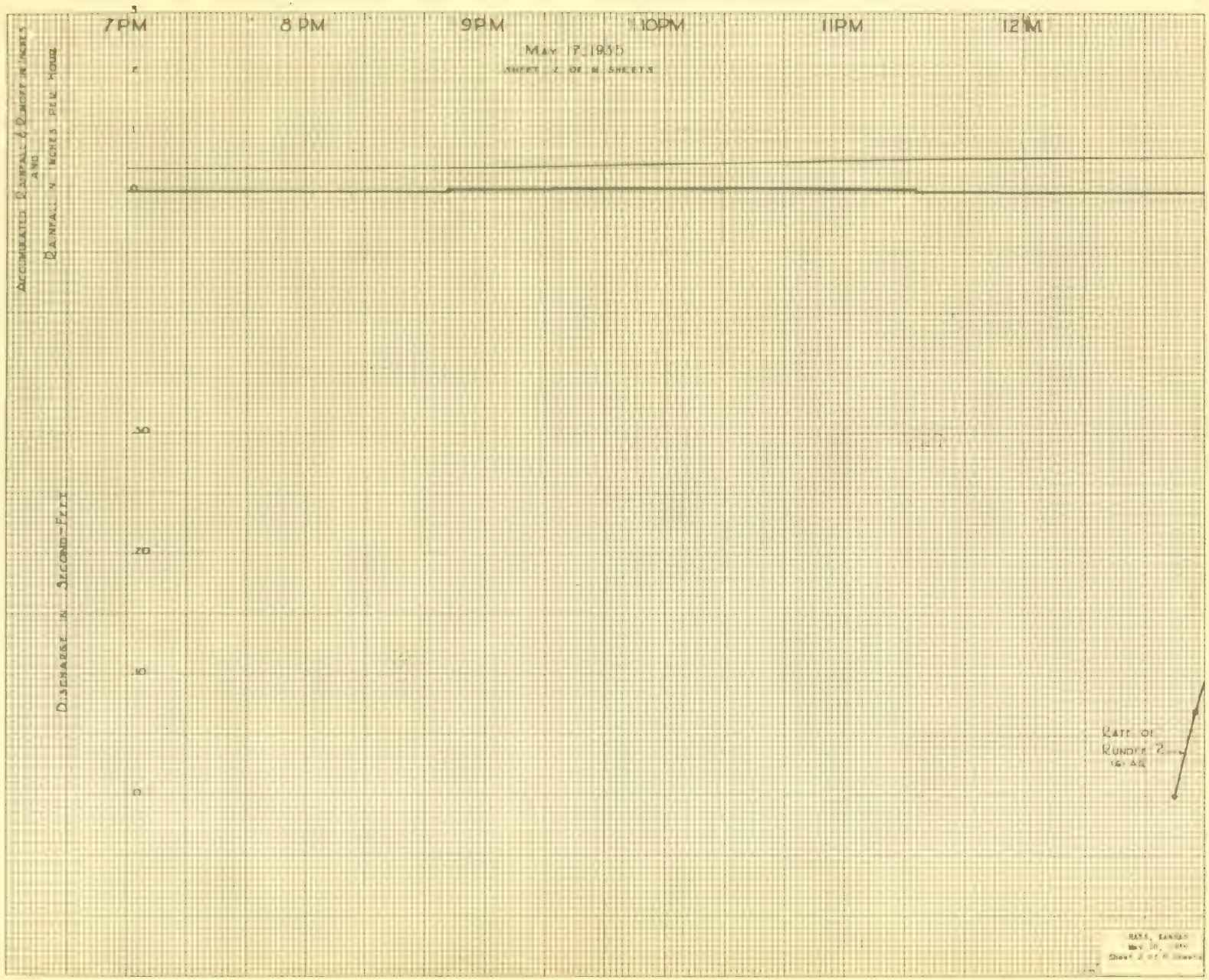

10AM
11AM
12N
1PM
2PM
3PM
MAY 13, 1935
SHEET 1 OF 2 SHEETS
INTENSITY (INS./HR.)
ACCUMULATED RAINFALL (GAGE 21)
ACCUMULATED RUNOFF
161 AG
RATE OF RUNOFF
DISCHARGE IN SECOND FEET
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND
RAINFALL IN INCHES PER HOUR
2PM
50
40
30
20
10
0
2
1
0

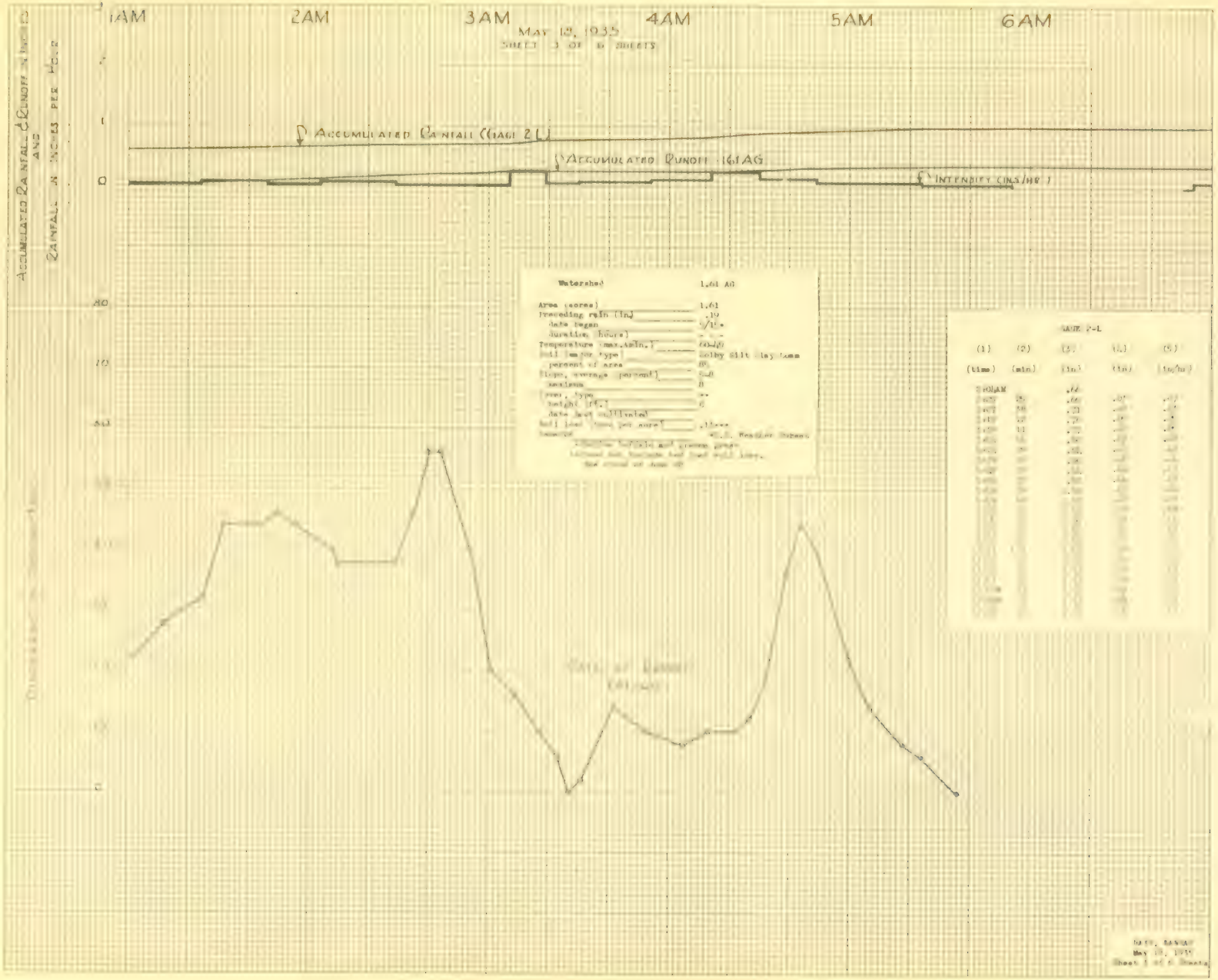

4PM
5PM
6PM
7PM
8 PM
9PM
MAY 13, 1937
SHEET 2 OF 2 SHEETS
ACCUMULATED RAINFALL (GAGE 2-L)
INTENSITY (INS./HR.)
ACCUMULATED RUNOFF (GAGE 2-L)
ACCUMULATED RUNOFF AND RAINFALL IN INCHES PER ACRE
DISCHARGE IN SECOND-FEET
Note. Runoff on Watershed 1-L estimated 160 cu ft or .0784 in. Check stopped on Watershed 6-L. Runoff estimated as 16 cu ft or .439 inches.
GAGE 2-L
(1) Time (t)
(2) Thr. (min.) (t)
(3) (ins. (d)
(4) (ins.) (d)
(5) (ins/hr) INTENSITY
5:00 1.58
5:05 .03 .36
5:10 1.61 .03 .18
5:15 1.64 .03 .18
5:30 1 45 1.64 .00 .00
5:45 .15 1.80 .16 .16
6:00 .15 1.82 .02 .10
6:15 15 1.86 .04 .16
6:30 45 1.88 .02 .08
6:45 15 1.90 .02 .08
7:03 18 1.95 .05 .17
7:25 22 1.99 .04 .12
7:35 10 1.60 .01 .06
7:50 30 1.60 .00 .00
8:05 15 1.62 .02 .08
8:25 20 1.71 .09 .27
8:35 10 1.75 .04 .24
8:50 15 1.78 .03 .12
9:10 1 1.81 .03 .10
9:30 1 1.84 .03 .16
9:45 15 1.88 .04 .16
10:00 15 1.92 .01 .04
2-L 4-L 1.61AG
Area (acres) 1.03 .87 1.61
Preceding Rain (in.) .47* .47* .47*
date began 5/11 5/11 5/11
duration (hours) --- --- ---
Temperature (max & min.) 54 & 47
Soil (major type) Colby Silt Clay Loam
percent of area
Slope, average (per cent) 5-7 6-8 5-8
maximum 7 8 8
Cover, type Wheat Barley **
height (ft) 0.1 0 0
date last cultivated 9/27/34 4/20/35
Soil loss (tons per acre) 0 .01 .14
Remarks
* Record taken from U. S. Weather Bureau
** Includes bad weed soil loss
RATE OF RUNOFF GAGE 2-L
Time R.G. Acc. R.G.
2-L 3:08P 0 .216"
4-L 2:52P 0 .125"
1.61AG 8:54P 0 .291"
HAYS, KANSAS
May 13, 1937
Sheet 2 of 2 Sheets

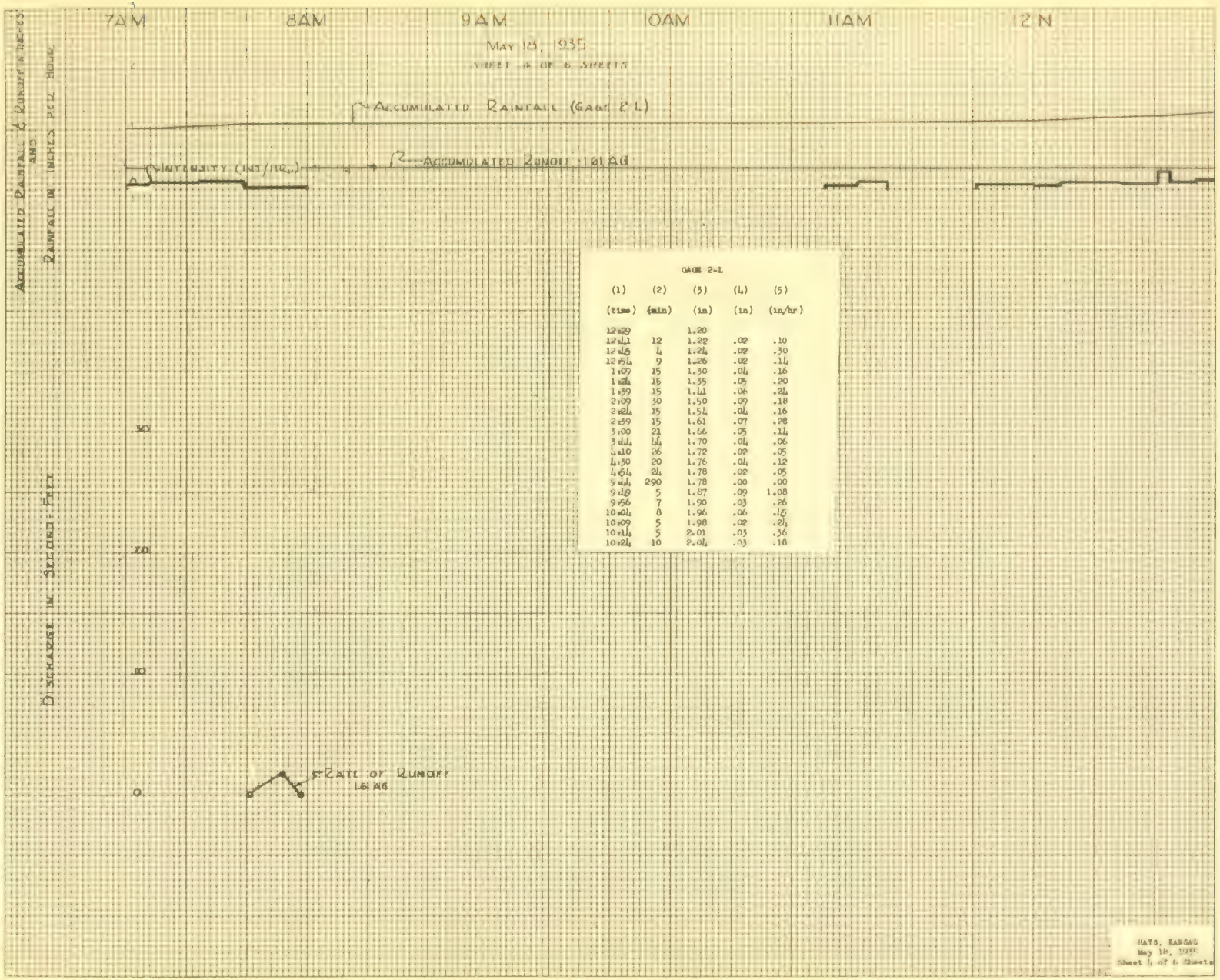


GAGE P-L

(1) Time (t)		(2) (hr. t	min.)	(3) (ins.) d	(4) (ins) d	(5) INTENSITY (ins/hr)
5/17	1:11.F			.00		
	1:14	10		.04	.04	.08
	2:09	25		.06	.02	.05
	2:40	31		.11	.05	.10
	5:09	2 8		.14	.03	.06
	5:18	16		.17	.03	.11
	5:32	14		.20	.03	.13
	5:53	21		.26	.06	.18
	4:11	18		.29	.03	.10
	4:21	13		.32	.03	.03
	5:00	4		.36	.04	.10
	5:14	26		.38	.02	.04
	6:12	28		.40	.02	.04
	7:18	6		.41	.01	.01
	7:23	7		.44	.03	.05
	10:20	7		.50	.06	.06
	10:24	4		.54	.04	.07
	11:24	6		.57	.03	.06
5/18	1:00A	36		.60	.03	.02
	1:24	24		.62	.02	.04
	1:46	22		.65	.03	.08
	2:02	16		.66	.01	.04

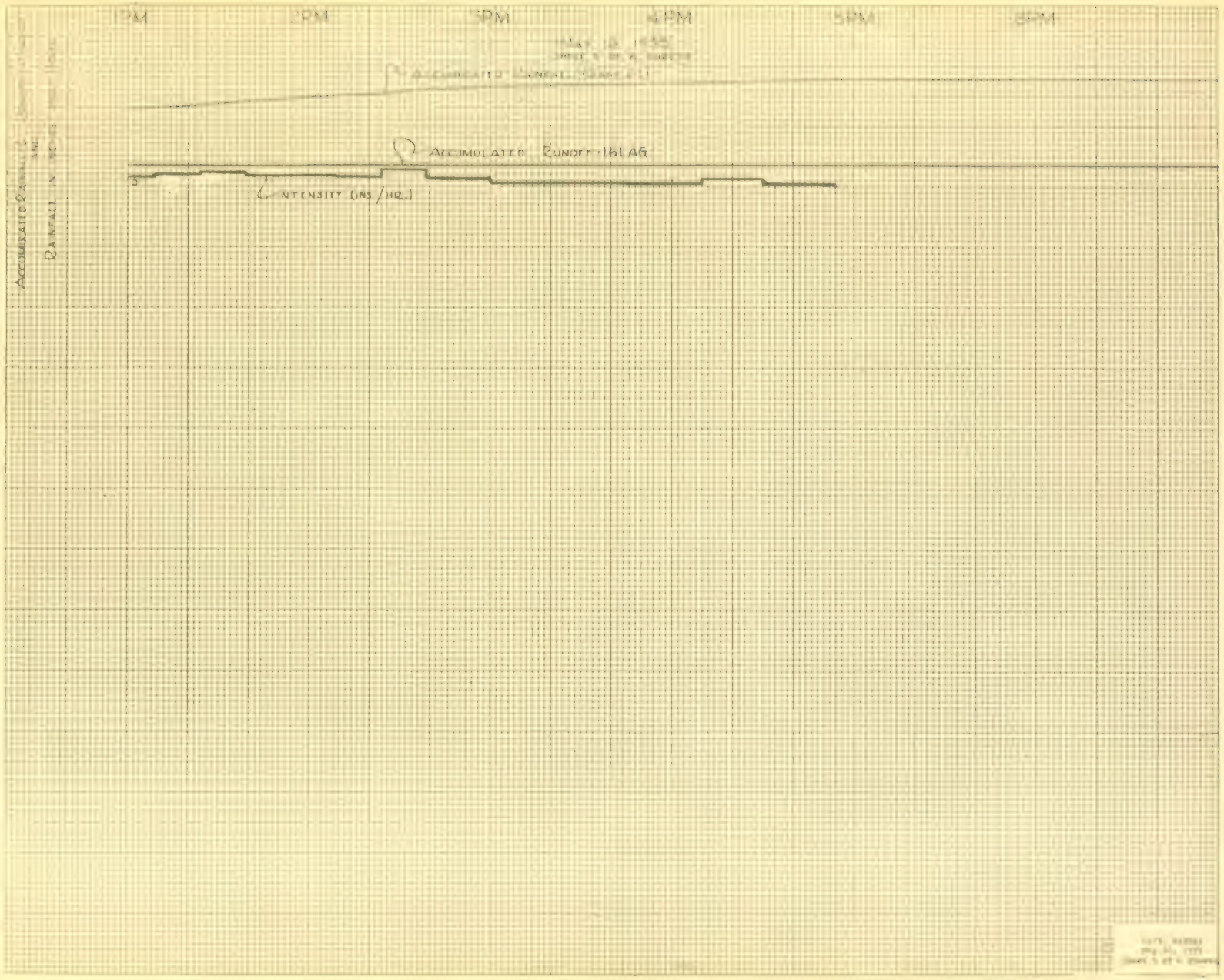

7 PM
8 PM
9 PM
10 PM
11 PM
12 M
May 17 1935
Sheet 2 of 4 Sheets
Accumulated Rainfall & Runoff in Inches
and
Rainfall in Inches per Hour
Discharge in Second-Feet
2
1
0
30
20
10
0
Rate of Rainfall 2 inches per hour

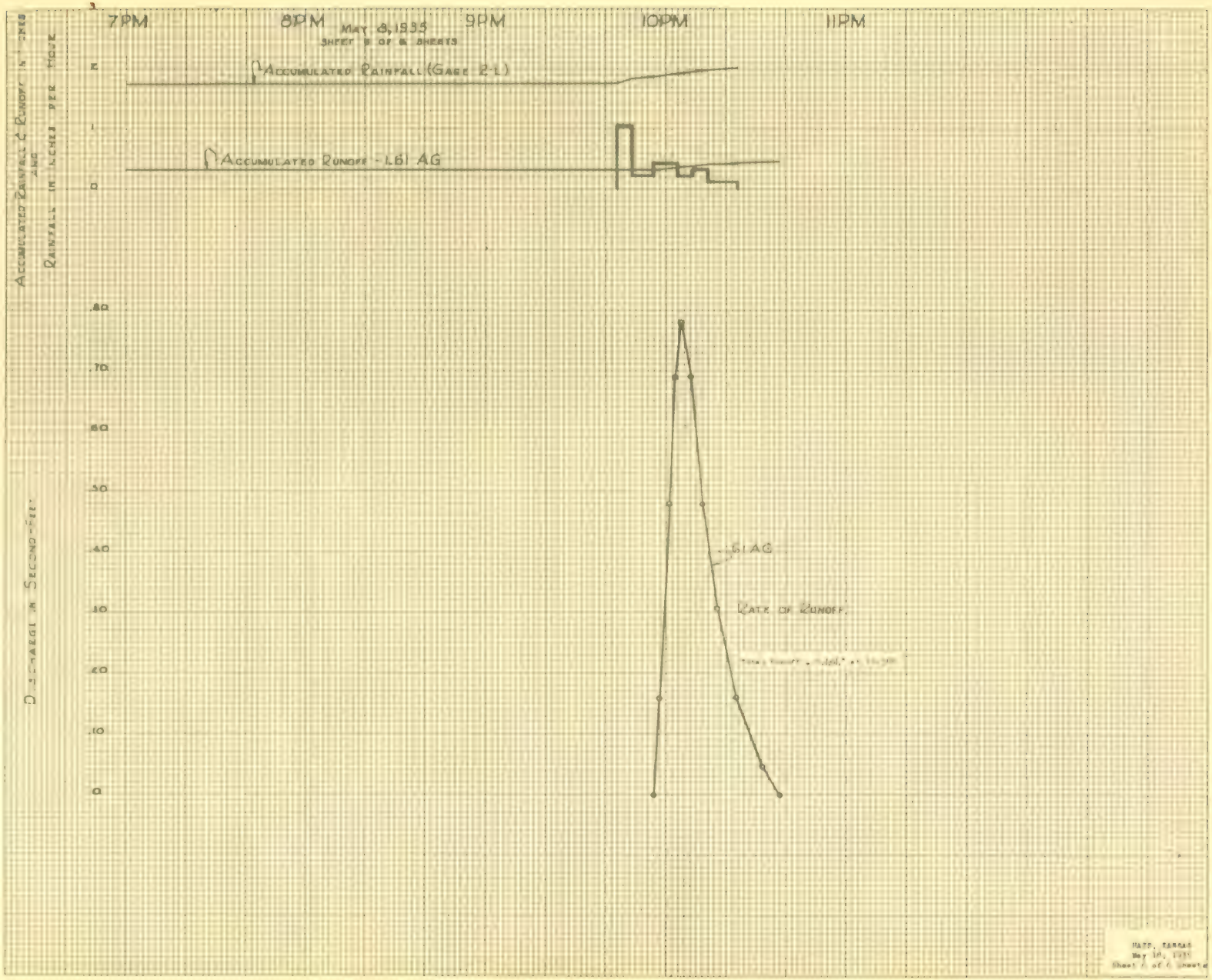

1AM
2AM
3AM
4AM
5AM
6AM
MAY 19, 1935
SHEET 3 OF 6 SHEETS
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
ACCUMULATED RAINFALL (GAGE 2-L)
ACCUMULATED RUNOFF 1.61 AC
INTENSITY (INS/HR.)
Watershed 1.61 AC
Area (acres) 1.61
Preceding rain (in.) .19
date began 5/15
duration, hours) - -
Temperature (max.&min.) 60-40
Soil (major type) Colby Silt clay loam
percent of area 80
Slope, average (percent) 5-8
Cover
kind
type
height (ft.)
date last cultivated
Soil loss (tons per acre) .11+++
Remarks
GAGE 2-L
(1) (2) (3) (4) (5)
(time) (min.) (in.) (in.) (in/hr.)
2 HOUR
RATE, RAINFALL
May 19, 1935
Sheet 3 of 6 Sheets

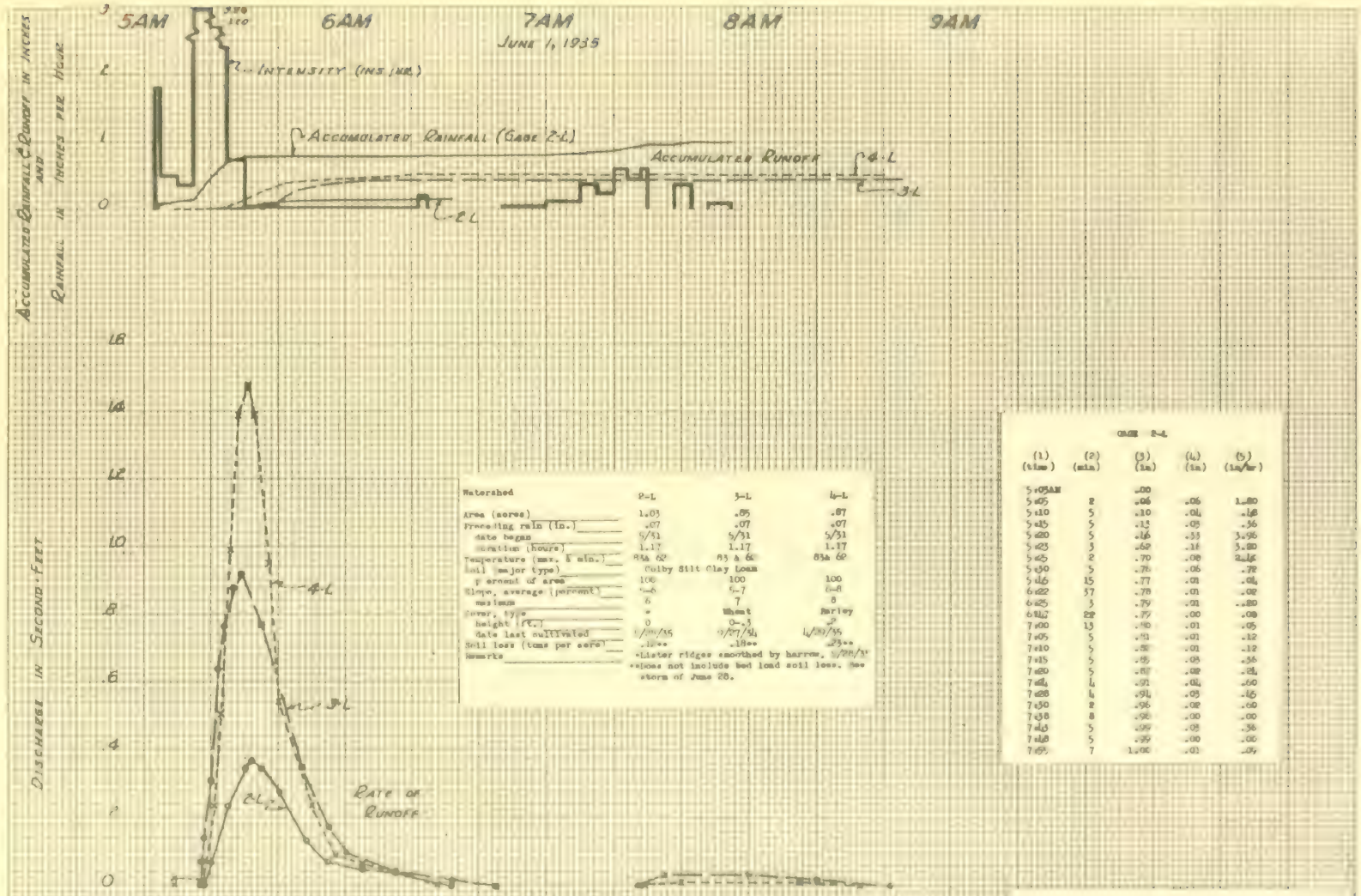


GAGE 2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
12:29		1.20		
12:41	12	1.22	.02	.10
12:45	4	1.24	.02	.30
12:54	9	1.26	.02	.14
1:09	15	1.30	.04	.16
1:24	15	1.35	.05	.20
1:39	15	1.41	.06	.24
2:09	30	1.50	.09	.18
2:24	15	1.54	.04	.16
2:39	15	1.61	.07	.28
3:00	21	1.66	.05	.14
3:44	44	1.70	.04	.06
4:10	26	1.72	.02	.05
4:30	20	1.76	.04	.12
4:54	24	1.78	.02	.05
9:44	290	1.78	.00	.00
9:49	5	1.87	.09	1.08
9:56	7	1.90	.03	.26
10:04	8	1.96	.06	.45
10:09	5	1.98	.02	.24
10:14	5	2.01	.03	.36
10:24	10	2.04	.03	.18


1PM
2PM
3PM
4PM
5PM
6PM
ACCUMULATED RUNOFF-LAG
INTENSITY (INS / HR.)


7PM
8PM
MAY 8, 1935
SHEET 5 OF 6 SHEETS
9PM
10PM
11PM
ACCUMULATED RAINFALL & RUNOFF IN "-INCHES AND RAINFALL IN INCHES PER HOUR
DISCHARGE IN SECOND-FEET
ACCUMULATED RAINFALL (GAGE 2-L)
ACCUMULATED RUNOFF - LBI AG
LBI AG
RATE OF RUNOFF
80
70
60
50
40
30
20
10
0



Watershed	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding rain (in.)	.07	.07	.07
date began	5/31	5/31	5/31
duration (hours)	1.17	1.17	1.17
Temperature (max. & min.)	83a 62	83 & 62	83a 62
Soil (major type)	Colby Silt Clay Loam		
Percent of area	100	100	100
Slope, average (percent)	4-6	6-7	6-8
maximum	6	7	8
Cover, type	-	Wheat	Barley
height (ft.)	0	0-.3	.3
date last cultivated	4/20/35	4/27/34	4/20/35
Soil loss (tons per acre)	.18**	.18**	.23**

*Lister ridges smoothed by harrow, 5/28/35
**Does not include bed load soil loss. See storm of June 28.

CAGE 2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
5:03AM		.00		
5:05	2	.06	.06	1.80
5:10	5	.10	.04	1.48
5:15	5	.13	.03	.36
5:20	5	.16	.03	3.96
5:23	3	.62	.14	5.20
5:25	2	.70	.08	2.16
5:30	5	.76	.06	.72
5:45	15	.77	.01	.04
6:22	37	.78	.01	.02
6:25	3	.79	.01	.20
6:47	22	.79	.00	.00
7:00	13	.80	.01	.05
7:05	5	.81	.01	.12
7:10	5	.82	.01	.12
7:15	5	.85	.03	.36
7:20	5	.87	.02	.24
7:24	4	.91	.04	.60
7:28	4	.94	.03	.45
7:30	2	.96	.02	.60
7:38	8	.98	.00	.00
7:43	5	.99	.01	.36
7:48	5	.99	.00	.00
7:55	7	1.00	.01	.09

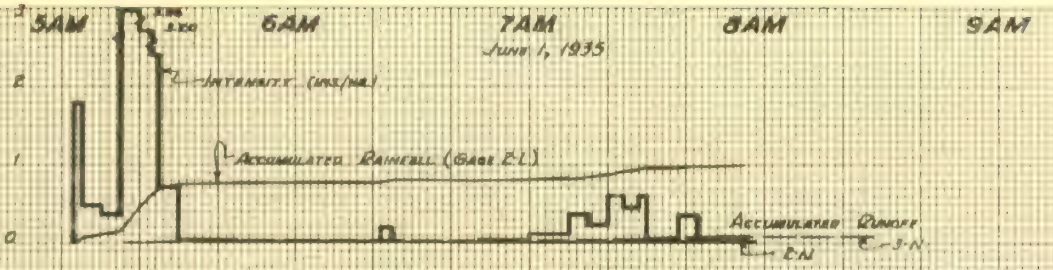
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO. _____ JUNE 1, 1935

Plot by S.A.H. date 11-27 checked by S.C.H. date 1-46
Computations by S.A.H. date 11-27 checked by L.C.W. date 1-46

Sheet 1 of 3 Sheets

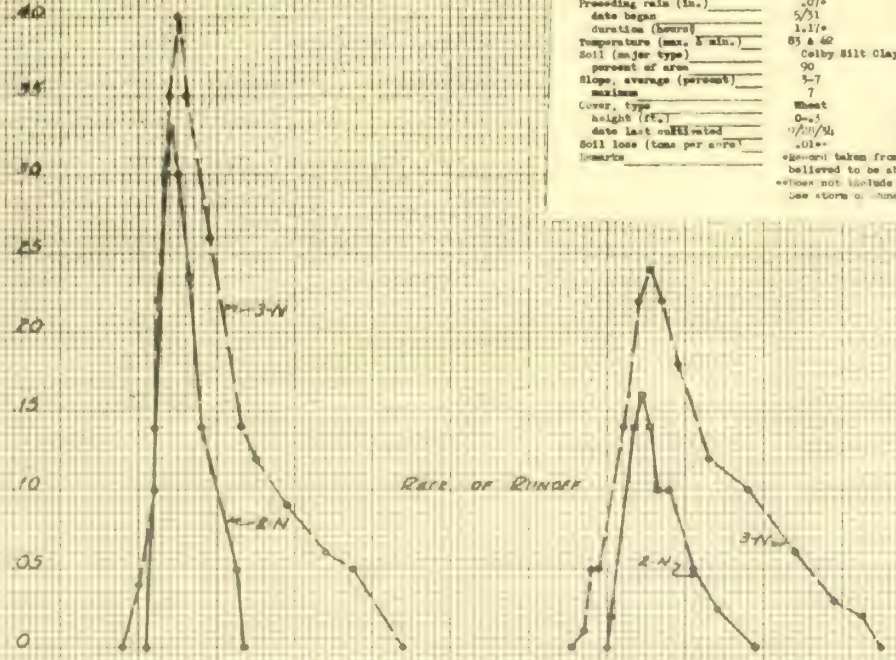


Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour

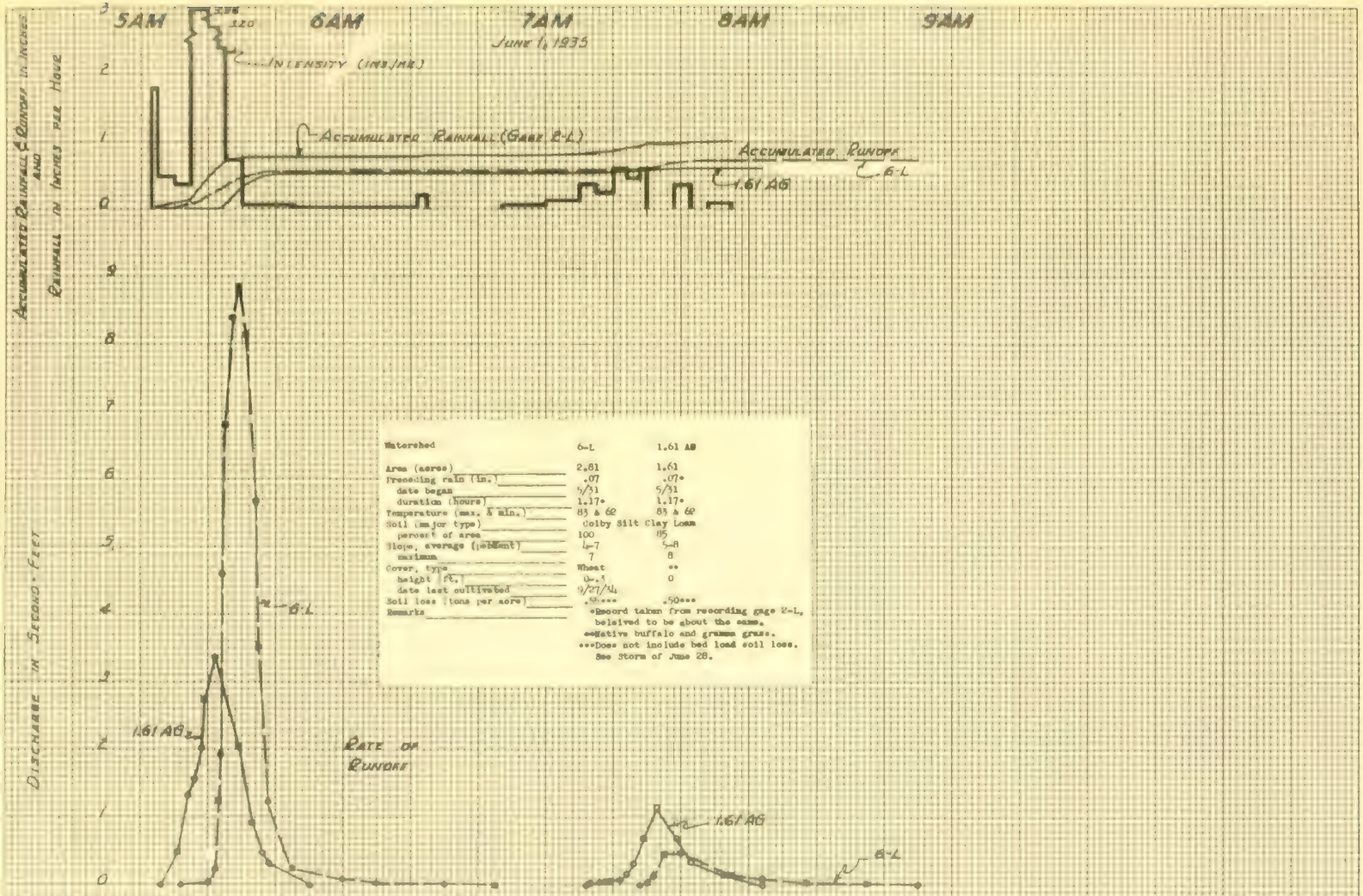
Watershed	2-B	3-B
Area (acres)	2.81	2.96
Preceding rain (in.)	.07*	.07*
date began	5/31	5/31
duration (hours)	1.17*	1.17*
Temperature (max. 5 min.)	83 & 62	83 & 62
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	5-7	5-7
maximum	7	7
Cover, type	Wheat	Wheat
height (ft.)	0-.5	0-.5
date last cultivated	9/28/34	9/28/34
Soil loss (tons per acre)	.01**	.01**
Remarks		

*Record taken from recording gage 2-L, believed to be about the same.
**does not include bed load soil loss. See storm of June 7th.

Discharge in Second-Feet

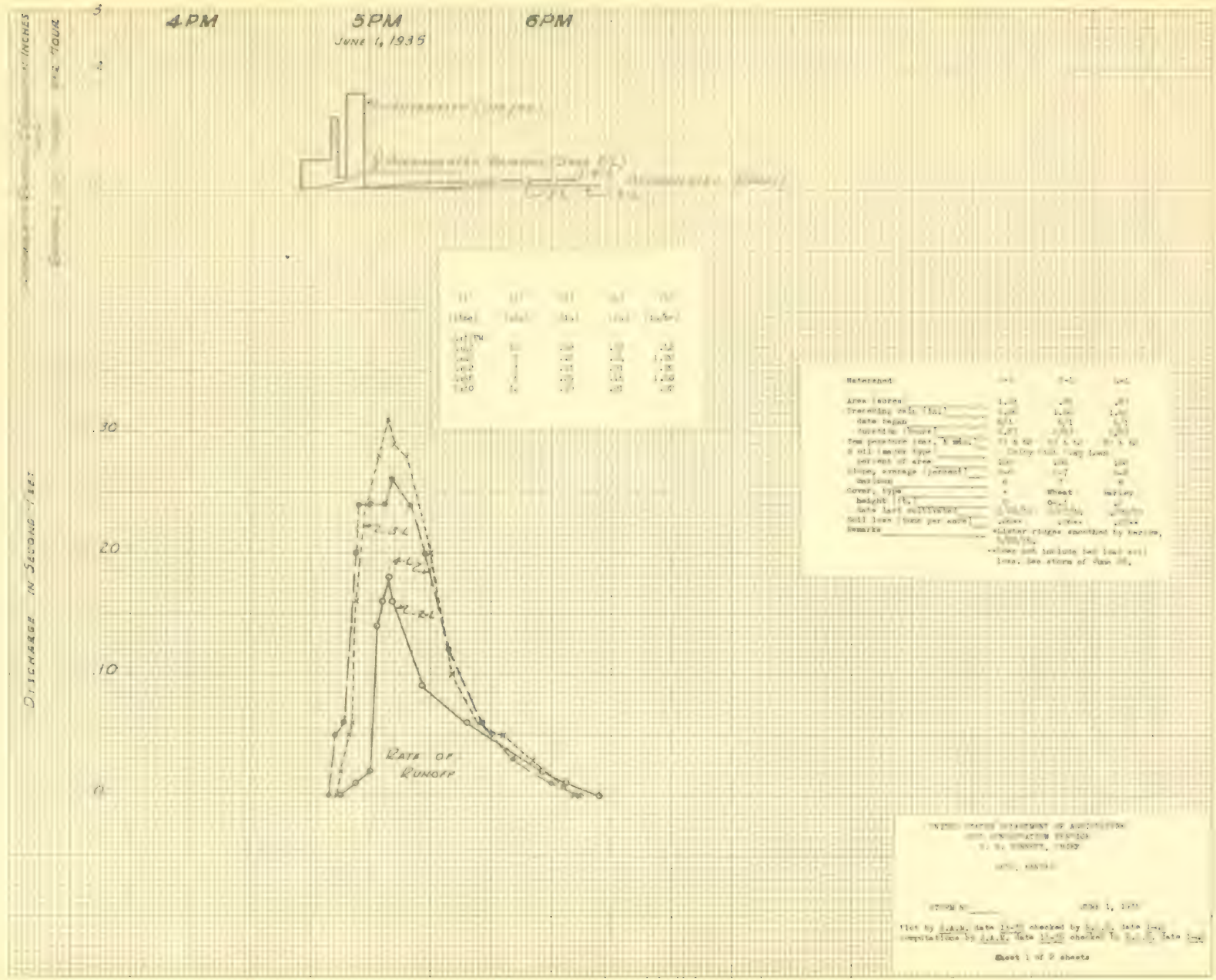


	Time	R.C.	Acc. R.C.
2-L	[illegible]5A	0	0.17"
3-L	[illegible]A	0	.16
4-L	[illegible]A	0	.12"
2-B	[illegible]A	0	.04"
3-B	[illegible]A	0	.03"
4-L	[illegible]	0	.12"
1-[illegible]	[illegible]A	0	.01



Watershed	6-L	1.61 AG
Area (acres)	2.81	1.61
Preceding rain (in.)	.07	.07*
date began	5/31	5/31
duration (hours)	1.17*	1.17*
Temperature (max. & min.)	83 & 62	83 & 62
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	85
Slope, average (per cent)	4-7	5-8
maximum	7	8
Cover, type	Wheat	**
height (ft.)	0-.1	0
date last cultivated	9/27/34	
Soil loss (tons per acre)	.58***	.50***
Remarks		

*Record taken from recording gage 2-L, believed to be about the same.
**Native buffalo and grama grass.
***Does not include bed load soil loss. See Storm of June 28.

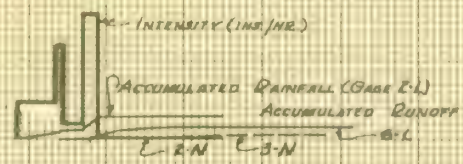

4PM
5PM
JUNE 1, 1935
6PM
DISCHARGE IN SECOND-FEET
30
20
10
0
RATE OF RUNOFF

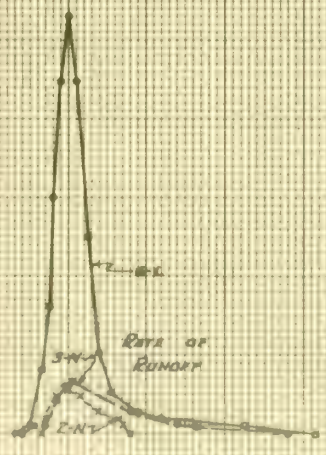
Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per 5 Min.

Discharge in Second Feet

4 PM 5 PM 6 PM

June 1, 1935





Watershed	2-S	3-S	6-L
Area (acres)	2.81	2.95	2.85
Preceding rain (in.)	.98	.98	1.00
date began	6/1	6/1	6/1
duration (hours)	2.87*	2.87*	2.87
Temperature (max. & min.)	83 & 62	83 & 62	83 & 62
Soil (major type)	Colby Silt Clay Loam		
percent of area	90	90	100
Slope, average (percent)	3-7	3-7	5-8
maximum	7	7	8
Cover, type	Wheat	Wheat	Wheat
height (ft.)	0-.3	0-.3	0-.3
date last cultivated	9/28/34	9/28/34	9/27/34
Soil loss (tons per acre)	0**	.61**	.15**
Remarks			

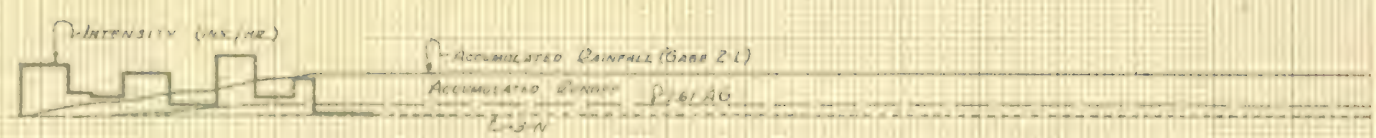
*Record taken from recording gage 2-L believed to be about the same.
**Does not include bed load soil loss. See storm of June 28.

	Time	R.G.	Acc. R.G.
2-L	6:15P	0	.071"
3-L	6:08P	0	.159"
6-L	6:10P	0	.170"
2-S	5:16P	0	.016"
3-S	5:56P	0	.036"
6-L	6:03P	0	.172"

RAIN, RUNOFF
June 1, 1935
Sheet 2 of 2 Sheets

8 AM 9 AM 10 AM 11 AM 12 N 1 PM

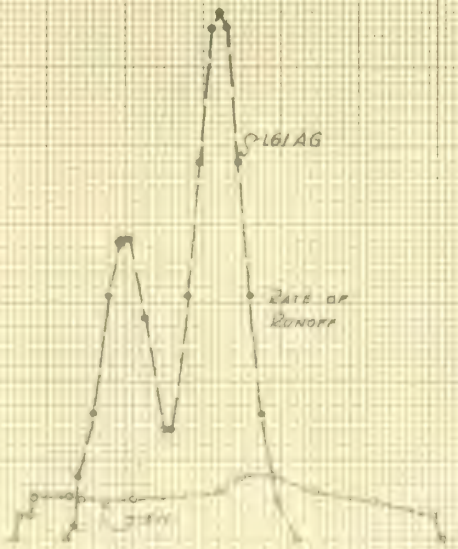
June 16, 1933
SHEET 1 OF 1 SHEETS



ACCUMULATED RAINFALL & RUNOFF: 1 INCH PER 1 INCH
RAINFALL: 1 INCH PER 1 INCH

DISCHARGE IN SECOND-FEET

2.0
1.0
.90
.80
.70
.60
.50
.40
.30
.20
.10



(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
8:15AM				
8:27	12	.13	.13	.65
8:33	6	.16	.03	.30
8:44	8	.19	.03	.23
8:53	12	.30	.11	.55
9:05	12	.33	.03	.15
9:15	10	.46	.13	.78
9:25	10	.50	.04	.24
9:50	5	.54	.04	.48
9:45	15	.56	.01	.04
2:05PM	2 [illegible]	.56	.00	.00
[illegible]	10	.71	.16	.96
[illegible]	15	.73	.02	.08
[illegible]	12	.74	.01	.05
[illegible]	5	.78	.02	.24

2-L

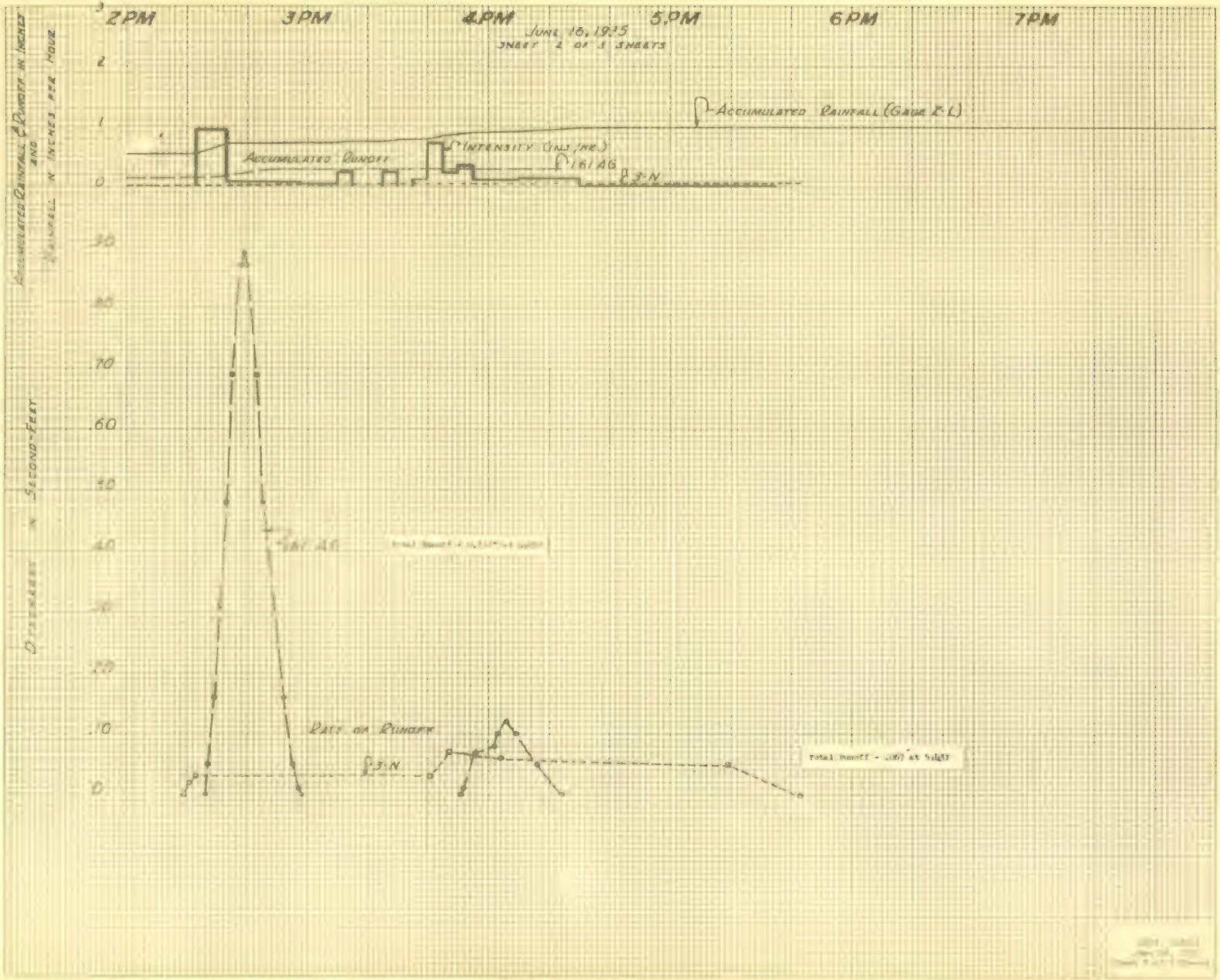
(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
5:15PM		.76		
5:25	10	.76	.00	.00
5:30	5	.78	.02	.24
5:35	5	.78	.00	.00
5:40	5	.79	.01	.12
5:46	5	.85	.06	.72
5:50	5	.87	.02	.24
5:55	5	.90	.03	.36
6:10	15	.93	.03	.12
6:30	20	.98	.05	.15
9:55	65	1.00	.02	.02
10:15	20	1.00	.00	.00
11:00	25	1.03	.03	.07
11:16	25	1.07	.04	.10
12:05AM	20	1.13	.06	.18

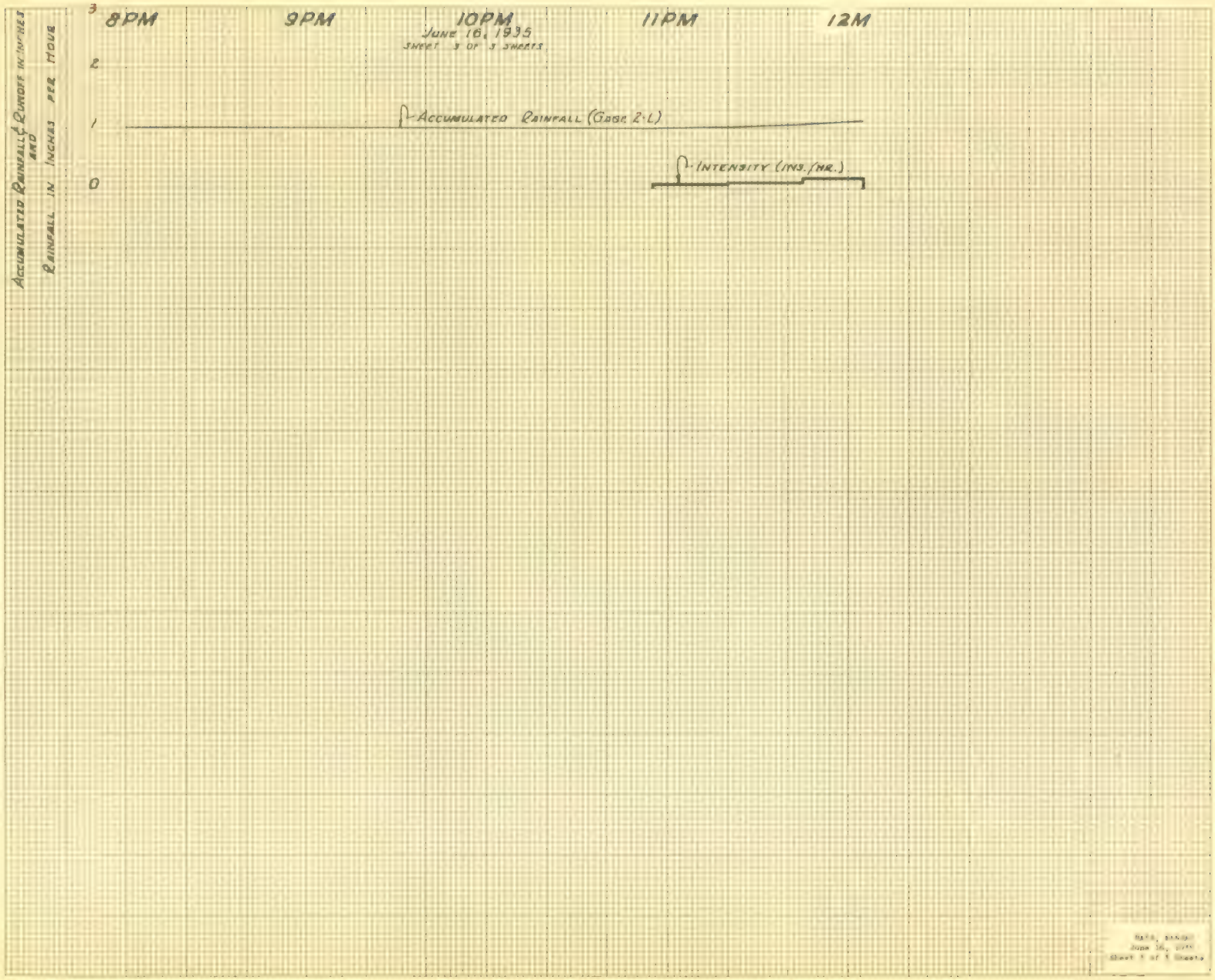
Watershed

Area (acres)	3.05	1.61
Preceding rain (in.)	.04+	.04+
date began	6/11	6/12
duration (hours)		
Temperature (max., F min.)		
Soil (major type)	76 & 61	76 & 61
percent of area	Valley Silty Clay Loam	
	90	85
Slope, average (percent)	1-7	5-8
	7	8
Cover, type	Wheat	ag
weight (lb.)	[illegible]	.05+.05
date last cultivated	[illegible]	
soil test (thou per acre)		
remarks		

Rainfall taken from recording gage 2-L, believed to be about the same.

[illegible] cattle and grama grass. [illegible] not include last [illegible] fell [illegible] over area of [illegible].

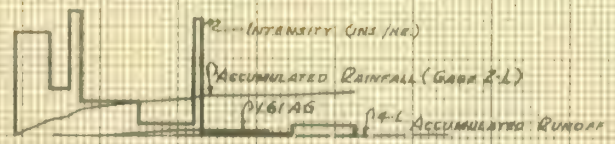

2PM
3PM
4PM
5PM
6PM
7PM
JUNE 16, 1925
SHEET 2 OF 3 SHEETS
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
DISCHARGE IN SECOND-FEET
ACCUMULATED RUNOFF
ACCUMULATED RAINFALL (GAGE K-L)
INTENSITY (INS./HR.)
RATE OF RUNOFF
Total Runoff - .007 at 5:45?


Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour
3
2
1
0
8PM
9PM
10PM
11PM
12M
June 16, 1935
Sheet 3 of 3 Sheets
Accumulated Rainfall (Gage 2-L)
Intensity (Ins./Hr.)

ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR

12AM 1AM 2AM 3AM

JUNE 25, 1933



GAGE 2-L

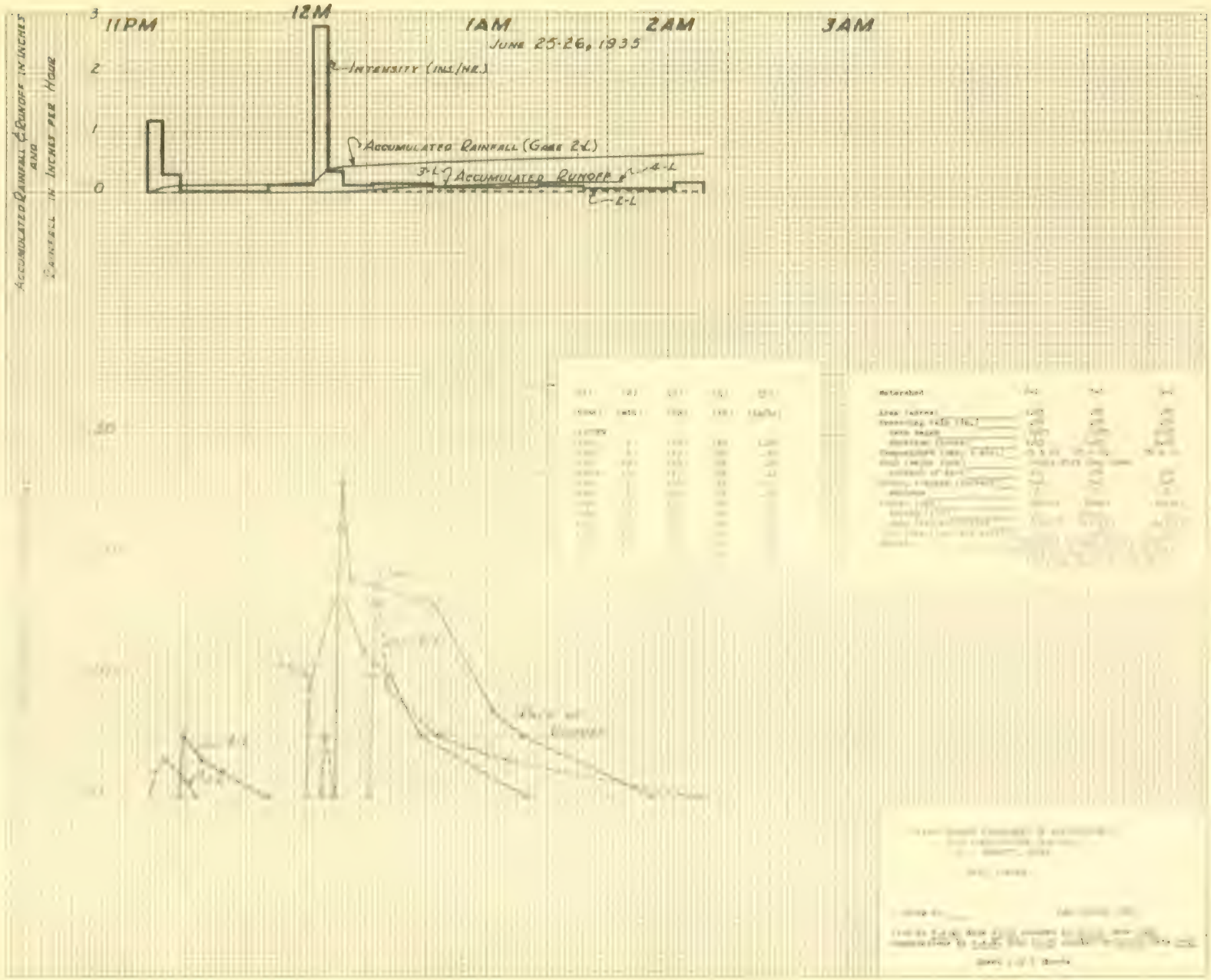
(1) (Time)	(2) (min.)	(3) (in)	(4) (in)	(5) (in/hr)
12AM				

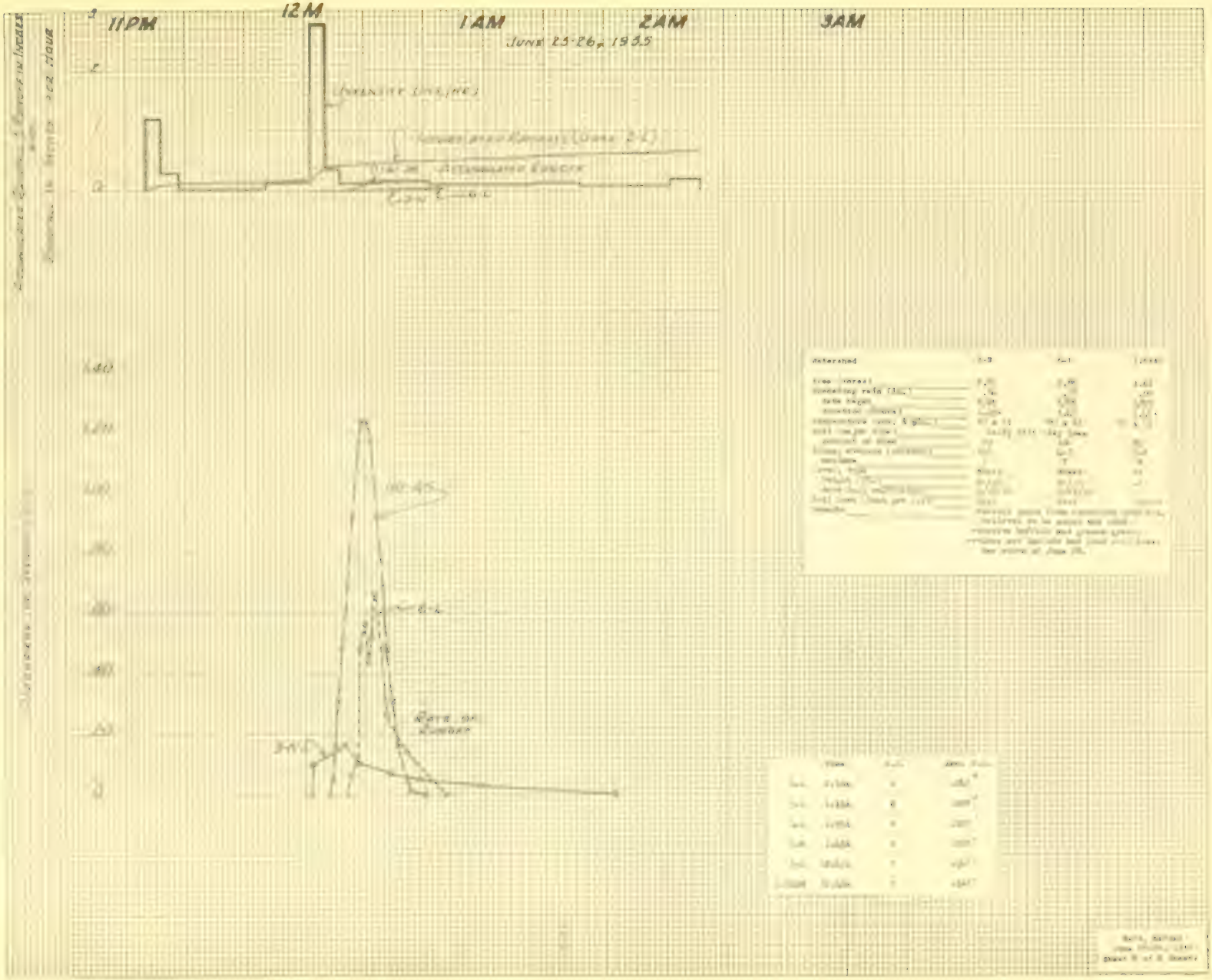
Watershed	L-L	L+LRU
Area (acres)		1.61
Preceding rain (in.)		1.17
date began	6/15	6/15
Duration(hours)	15.0+	15.0+
Temperature (max. & min.)	92 & 71	92 & 71
Soil: major type		Unity Silt clay loam
percent of area		98
Slope,average (percent)		5+8
aspect		S
Cover, type		**
weight (lb.)		
Date last cultivated		
Tool used (time per acre)		
Remarks		

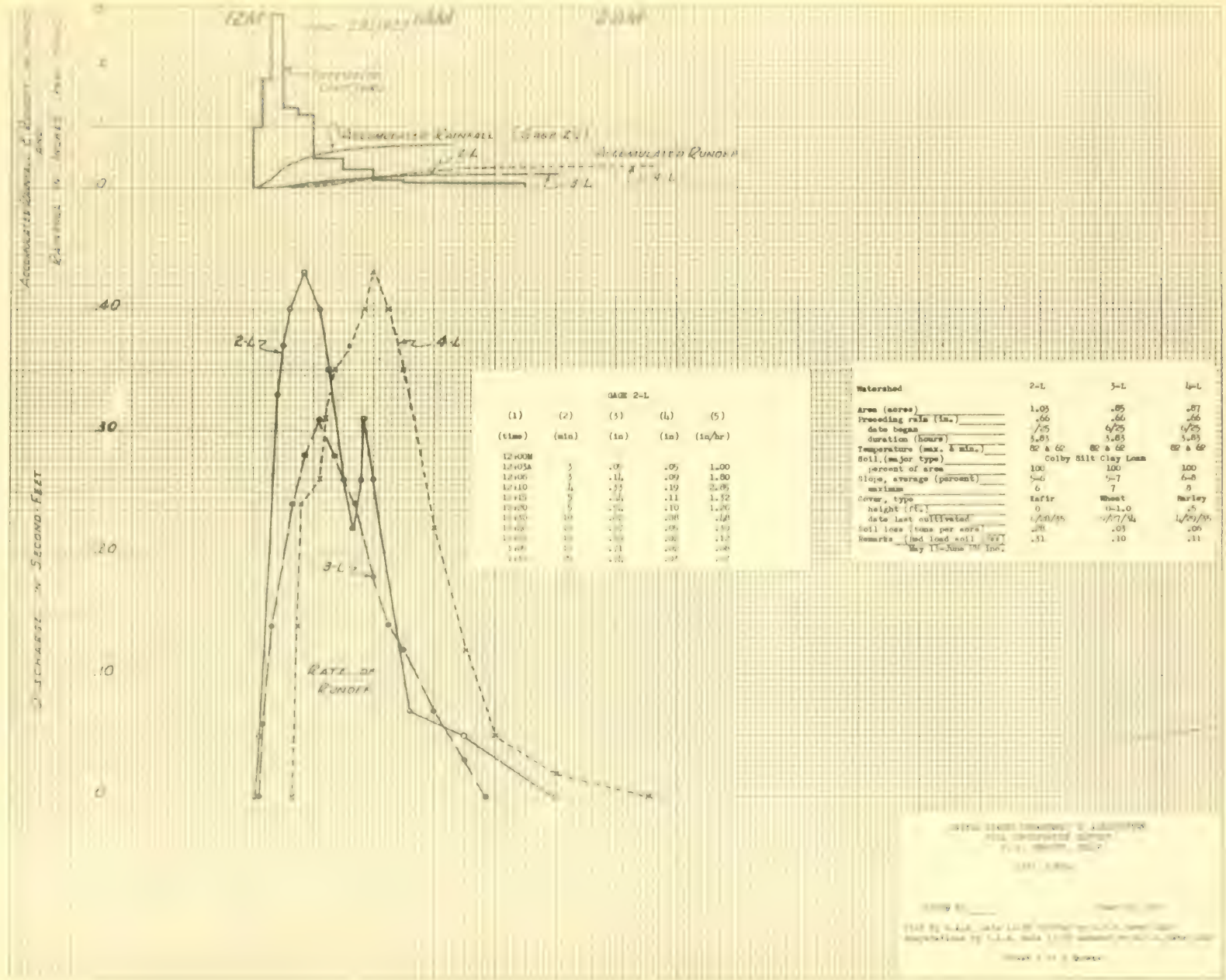


UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
U. S. SECURITY, OHIO

Sheet 1 of 1 sheets


ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
11PM
12M
1AM
2AM
3AM
JUNE 25-26, 1935
INTENSITY (INS./HR.)
ACCUMULATED RAINFALL (GAGE 2-L)
ACCUMULATED RUNOFF
3
2
1
0
20

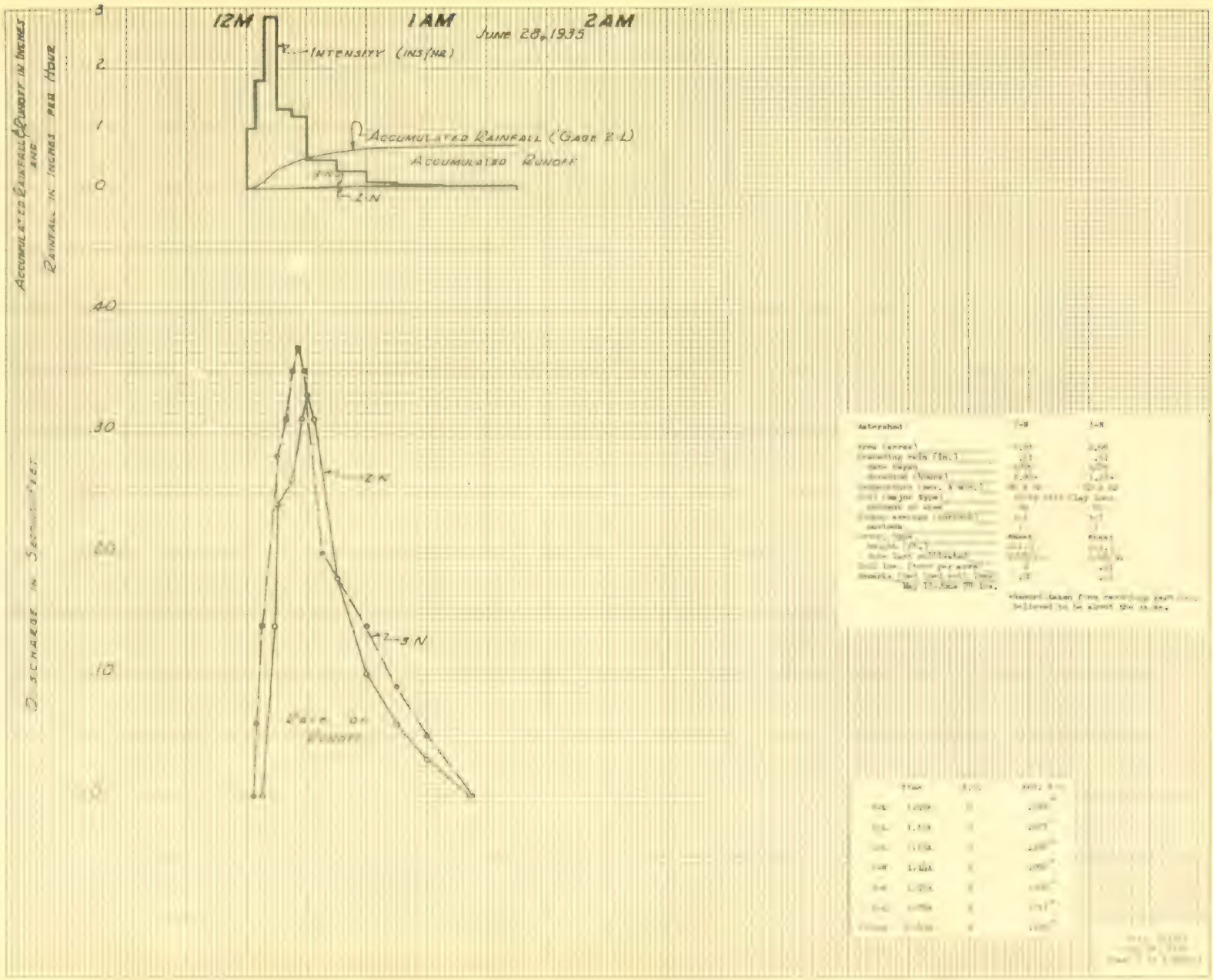

11PM
12M
1AM
2AM
3AM
JUNE 25-26, 1935

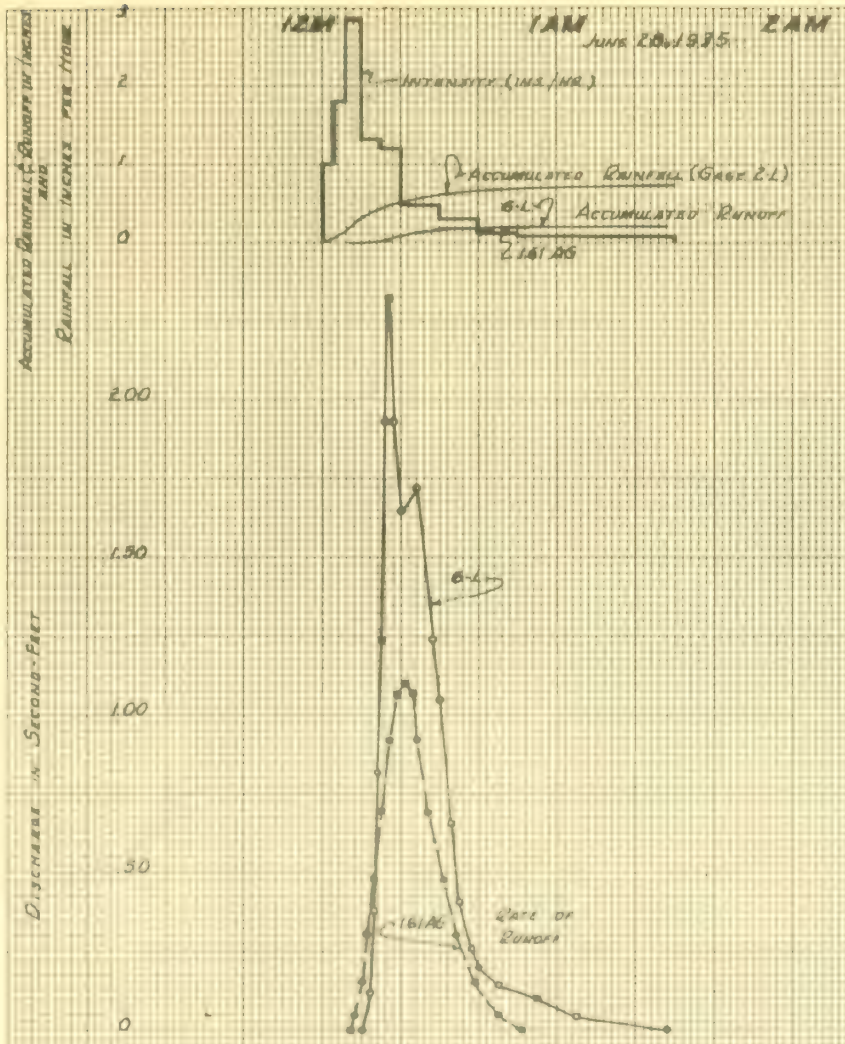


GAGE 2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
12:00M				
12:05A	5	.07	.07	1.00
12:06	1	.11	.09	1.80
12:10	4	.35	.19	2.85
12:15	5	.41	.11	1.32
12:20	5	.51	.10	1.20
12:50	30	.61	.10	1.20
1:05	15	.69	.08	.96
1:20	15	.79	.10	1.20
1:35	15	.84	.05	.60
1:40	5	.91	.07	.84

Watershed	2-L	3-L	4-L
Area (acres)	1.05	.85	.87
Preceding rain (in.)	.66	.66	.66
date began	/25	6/25	6/25
duration (hours)	5.83	5.83	5.83
Temperature (max. & min.)	82 & 62	82 & 62	82 & 62
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Kafir	Wheat	Barley
height (ft.)	0	0-1.0	.5
date last cultivated	6/20/35	6/7/35	6/20/35
Soil loss (tons per acre)	.08	.03	.04
Remarks (bad load soil 6/4 May 11-June 7th Inc.	.51	.10	.11

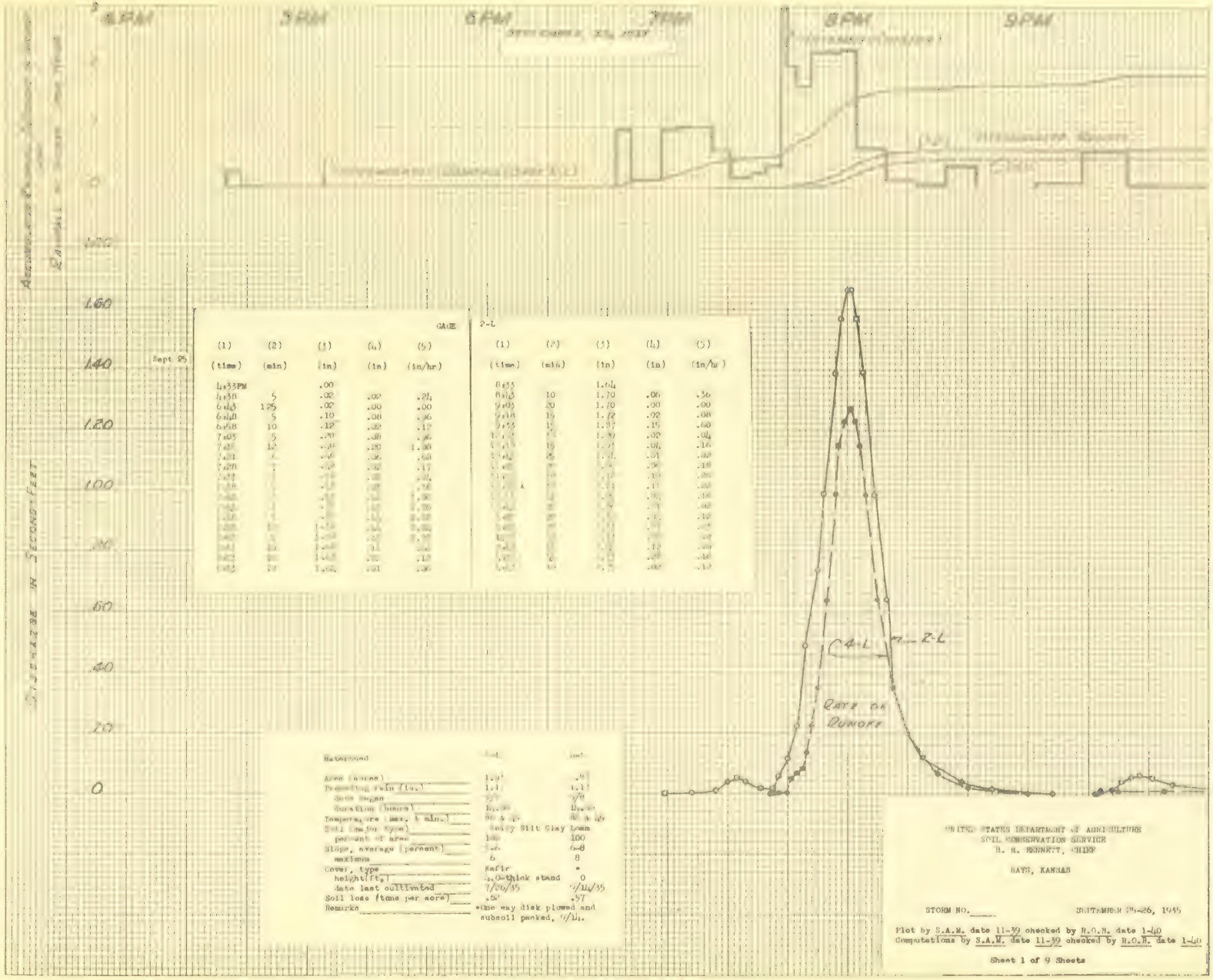

12M
1AM
2AM
JUNE 28, 1935
I---INTENSITY (INS/HR)
ACCUMULATED RAINFALL ('GAGE R.L)
ACCUMULATED RUNOFF
1.N
2.N
2.K
3.N
RAIN OR RUNOFF
ACCUMULATED RAINFALL AND RUNOFF IN INCHES
RAINFALL IN INCHES PER HOUR
DISCHARGE IN SECOND-FEET
3
2
1
0
40
30
20
10
0



Watershed	6-L	1.61Ac
Area (acres)	2.85	1.61
Preceding rain (In.)	.66	.80
date, began	6/25	6/25
duration (hours)	3.83	3.83
Temperature (max. 5 min.)	82 & 62	82 & 62
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	85
Slope, average (percent)	4-7	4-8
maximum	7	8
Cover, type	Wheat	**
height (Ft.)	0-1.0	0-1.0
date last cultivated	4/1/34	
Soil Loss (Tons per acre)	.06	.00
Remarks (Bed load soil Loss) May 15-June 28 Inc.	.25	.17

*Record taken from recording gage 2-L, believed to be about the same.
**Native buffalo and grama grass.

Hays, Kansas
June 28, 1935
Sheet 1 of 1 Sheets

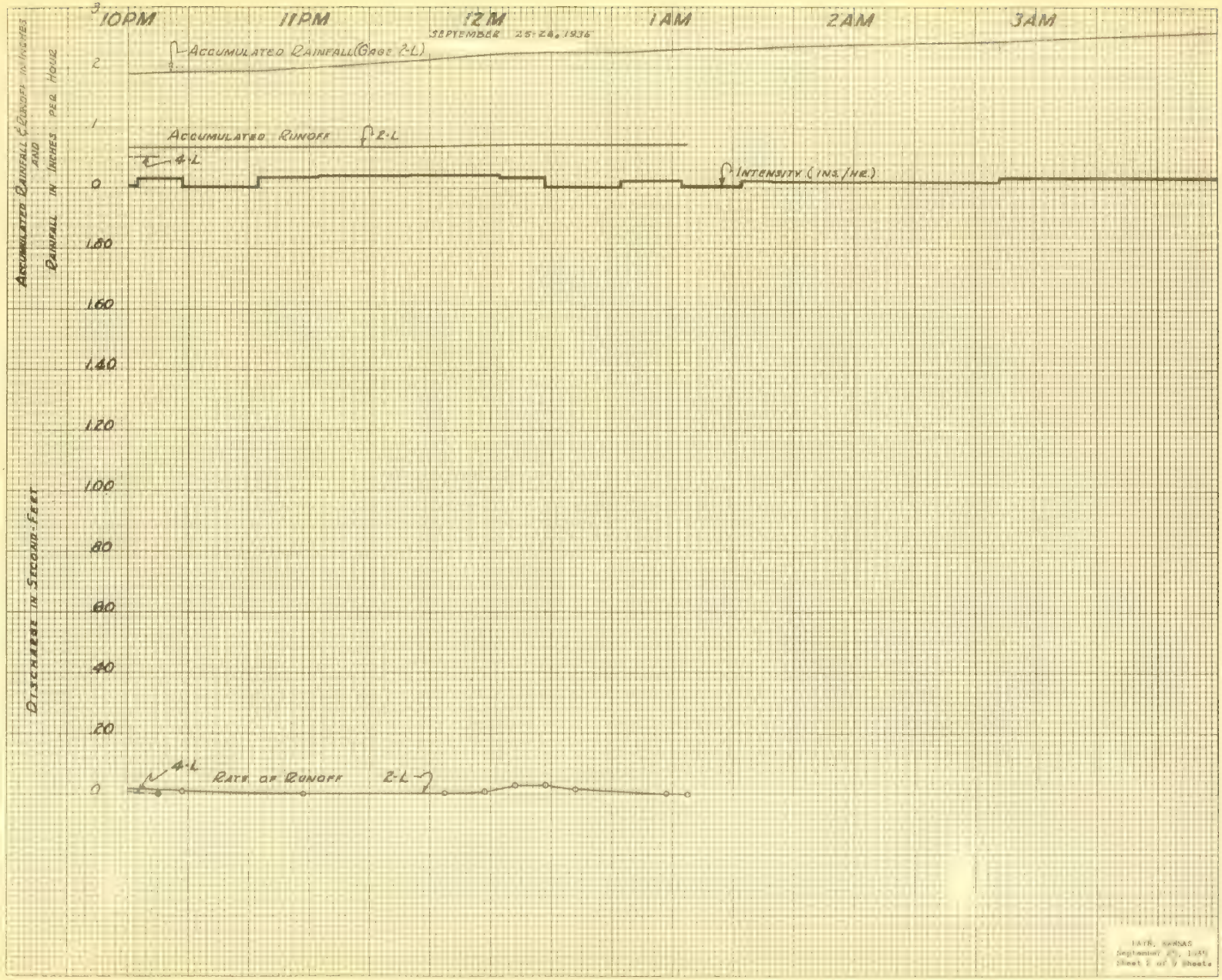


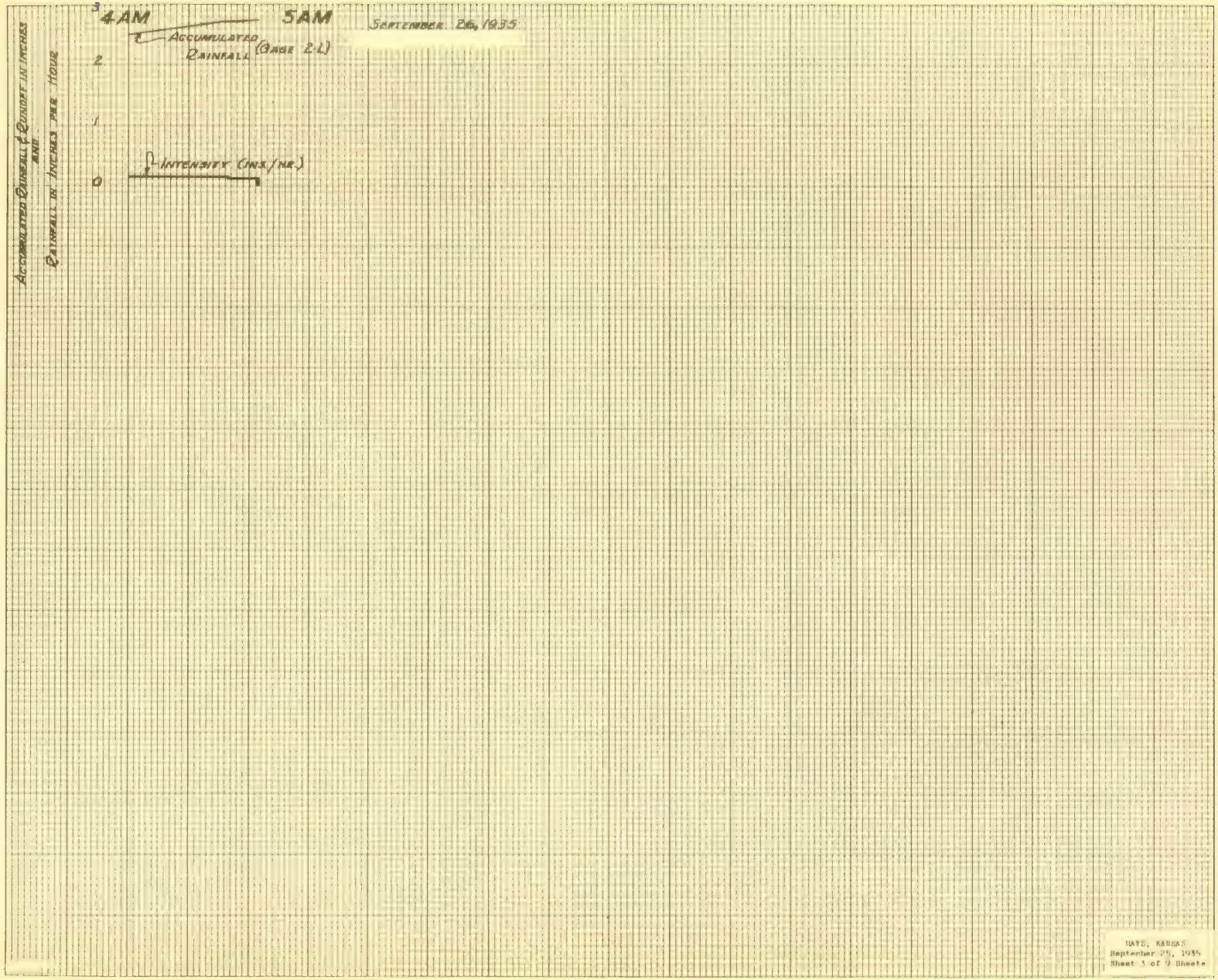
GAGE A-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
4:33PM		.00		
4:38	5	.02	.02	.24
6:43	125	.02	.00	.00
6:48	5	.10	.08	.96
6:58	10	.12	.02	.12
7:03	5	.20	.08	.96
7:15	12	.30	.10	1.00
7:21	6	.34	.04	.40
7:26	5	.38	.04	.48
7:32	6	.40	.02	.24
7:38	6	.42	.02	.24
7:48	10	.44	.02	.12
7:53	5	.46	.02	.24
7:58	5	.48	.02	.24
8:03	5	.50	.02	.24
8:08	5	.52	.02	.24
8:13	5	.54	.02	.24
8:18	5	.56	.02	.24
8:23	5	.58	.02	.24
8:28	5	.60	.02	.24
8:33	5	.62	.02	.24
8:38	5	.64	.02	.24
8:43	5	.66	.02	.24
8:48	5	.68	.02	.24
8:53	5	.70	.02	.24
8:58	5	.72	.02	.24
9:03	5	.74	.02	.24
9:08	5	.76	.02	.24
9:13	5	.78	.02	.24
9:18	5	.80	.02	.24
9:23	5	.82	.02	.24
9:28	5	.84	.02	.24
9:33	5	.86	.02	.24
9:38	5	.88	.02	.24
9:43	5	.90	.02	.24
9:48	5	.92	.02	.24
9:53	5	.94	.02	.24
9:58	5	.96	.02	.24
10:03	5	.98	.02	.24
10:08	5	1.00	.02	.24
10:13	5	1.02	.02	.24

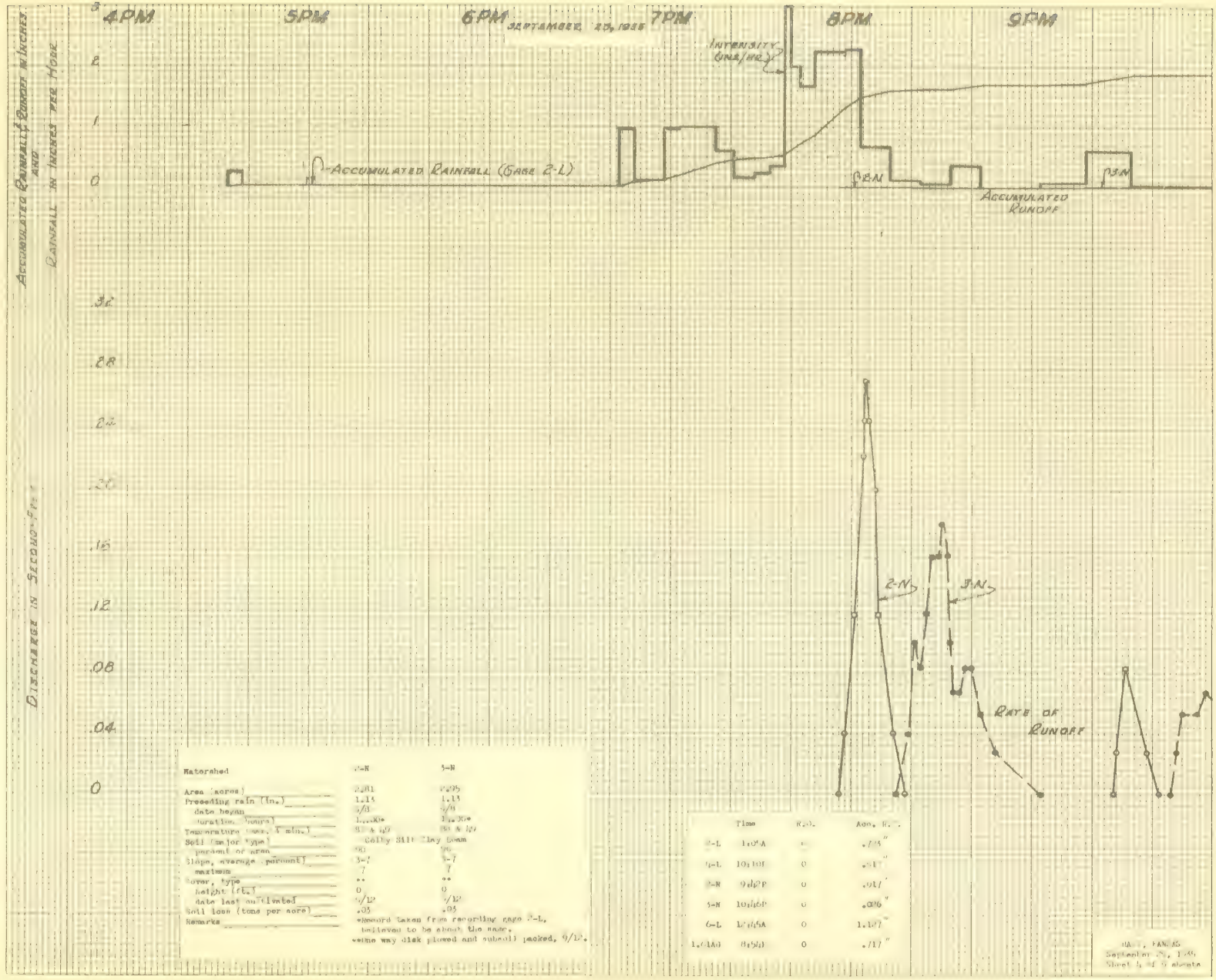
GAGE Z-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
8:53		1.64		
8:58	10	1.70	.06	.36
9:03	20	1.70	.00	.00
9:18	15	1.72	.02	.08
9:33	15	1.87	.15	.60	
1:[illegible]	[illegible]	1.89	.02	.04
[illegible]	15	1.[illegible]	.01	.16
[illegible]	25	1.[illegible]	.01	.02
[illegible]	[illegible]	[illegible]	.06	.24
[illegible]	[illegible]	[illegible]	.10	.40
[illegible]	[illegible]	[illegible]	.11	.22
[illegible]	[illegible]	[illegible]	.15	.60
[illegible]	[illegible]	[illegible]	.11	.44
[illegible]	[illegible]	[illegible]	.11	.44
[illegible]	[illegible]	[illegible]	.11	.44


10PM
11PM
12M
SEPTEMBER 25-26, 1936
1AM
2AM
3AM
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
ACCUMULATED RAINFALL (GAGE 2-L)
ACCUMULATED RUNOFF 2-L
4-L
INTENSITY (INS./HR.)
DISCHARGE IN SECOND-FEET
1.80
1.60
1.40
1.20
1.00
80
60
40
20
4-L
RATE OF RUNOFF 2-L



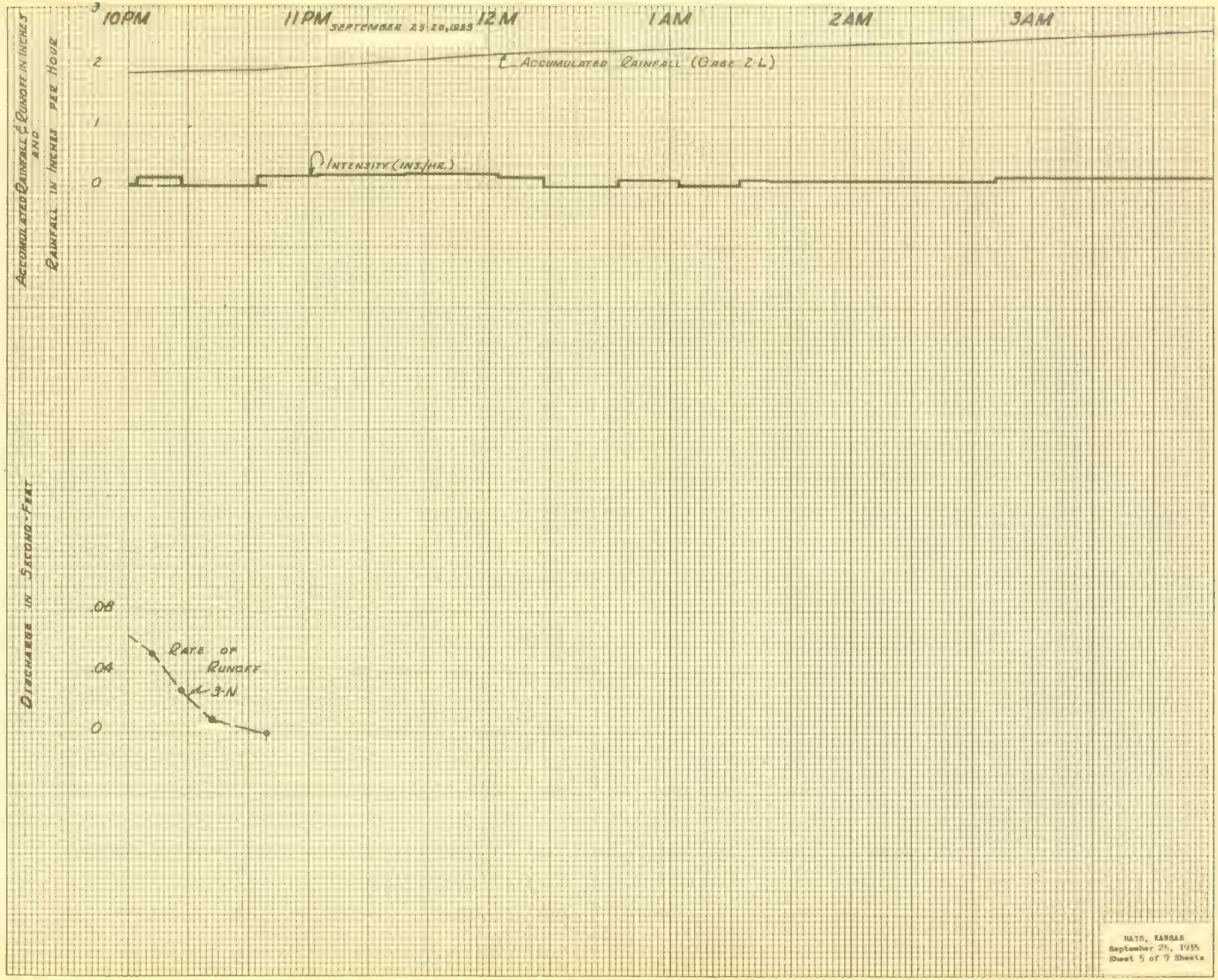
HAYS, KANSAS
September 25, 1935
Sheet 1 of 9 Sheets



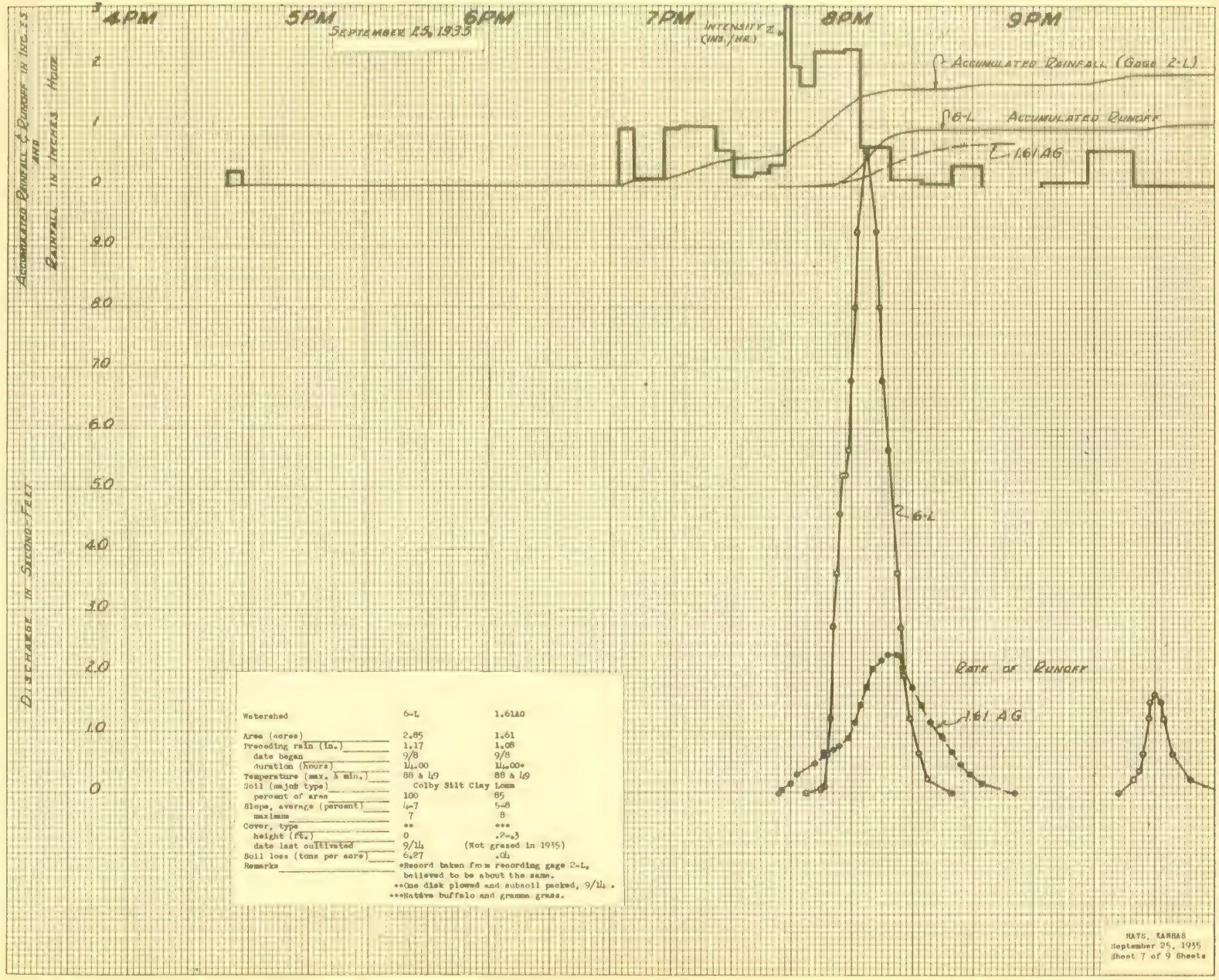
Watershed	2-N	3-N
Area (acres)	2.81	2.95
Preceding rain (in.)	1.15	1.13
date began	9/8	9/8
duration (hours)	1.30e	1.30e
Temperature (max. & min.)	91 & 60	89 & 60
Soil (major type)	Gelly Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	**	**
height (ft.)	0	0
date last cultivated	9/12	9/12
Soil loss (tons per acre)	.05	.05
Remarks	*Record taken from recording gage 2-L, believed to be about the same. **Some way disk plowed and subsoil hoked, 9/12.	

	Time	R.O.	Acc. R.O.
2-L	1:05A		.185"
4-L	10:10P	0	.217"
2-N	9:42P	0	.041"
3-N	10:46P	0	.036"
6-L	1:18A	0	1.187"
1.(1A)	8:58A	0	.117"

U.S.D.A., FARMING
September 25, 1936
Sheet 4 of 5 sheets


ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
DISCHARGE IN SECOND-FEET
10PM
11PM
SEPTEMBER 25-26, 1935
12M
1AM
2AM
3AM
3
2
1
0
Σ ACCUMULATED RAINFALL (GAGE 2-L)
INTENSITY (INS./HR.)
.08
.04
0
RATE OF RUNOFF
3-N
HAYS, KANSAS
September 25, 1935
Sheet 5 of 9 Sheets

ACCUMULATED RAINFALL & QUARTER HR INCHES
AND
RAINFALL 1HR INCHES PER HOUR
4AM
4AM
ACCUMULATED
RAINFALL (QUARTERLY)
SAM
INTENSITY (INCH/HR)
SHEATHING 20 YEAR
Kansas, 68583
September 25, 1991
Sheet 6 of 9 Sheets

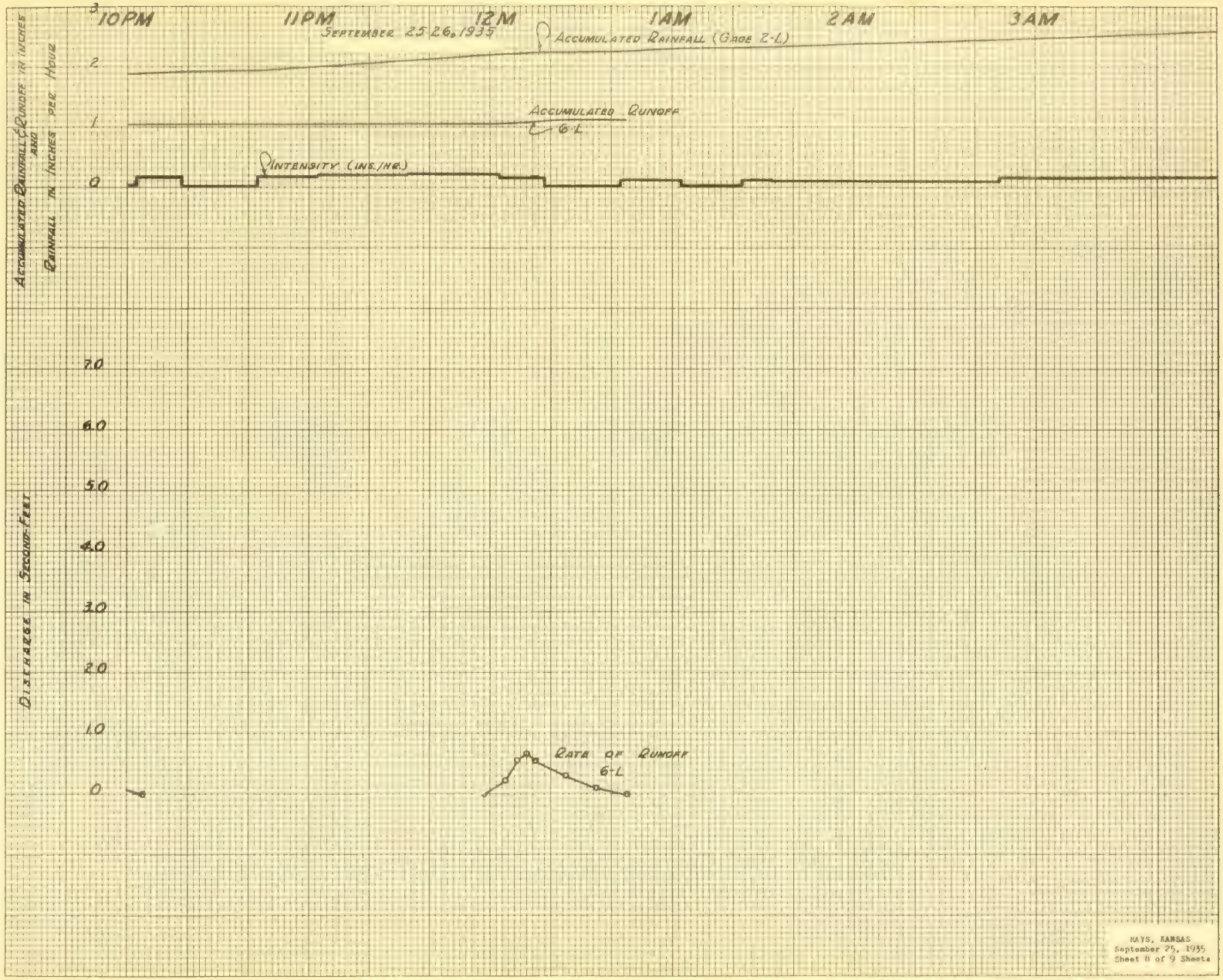


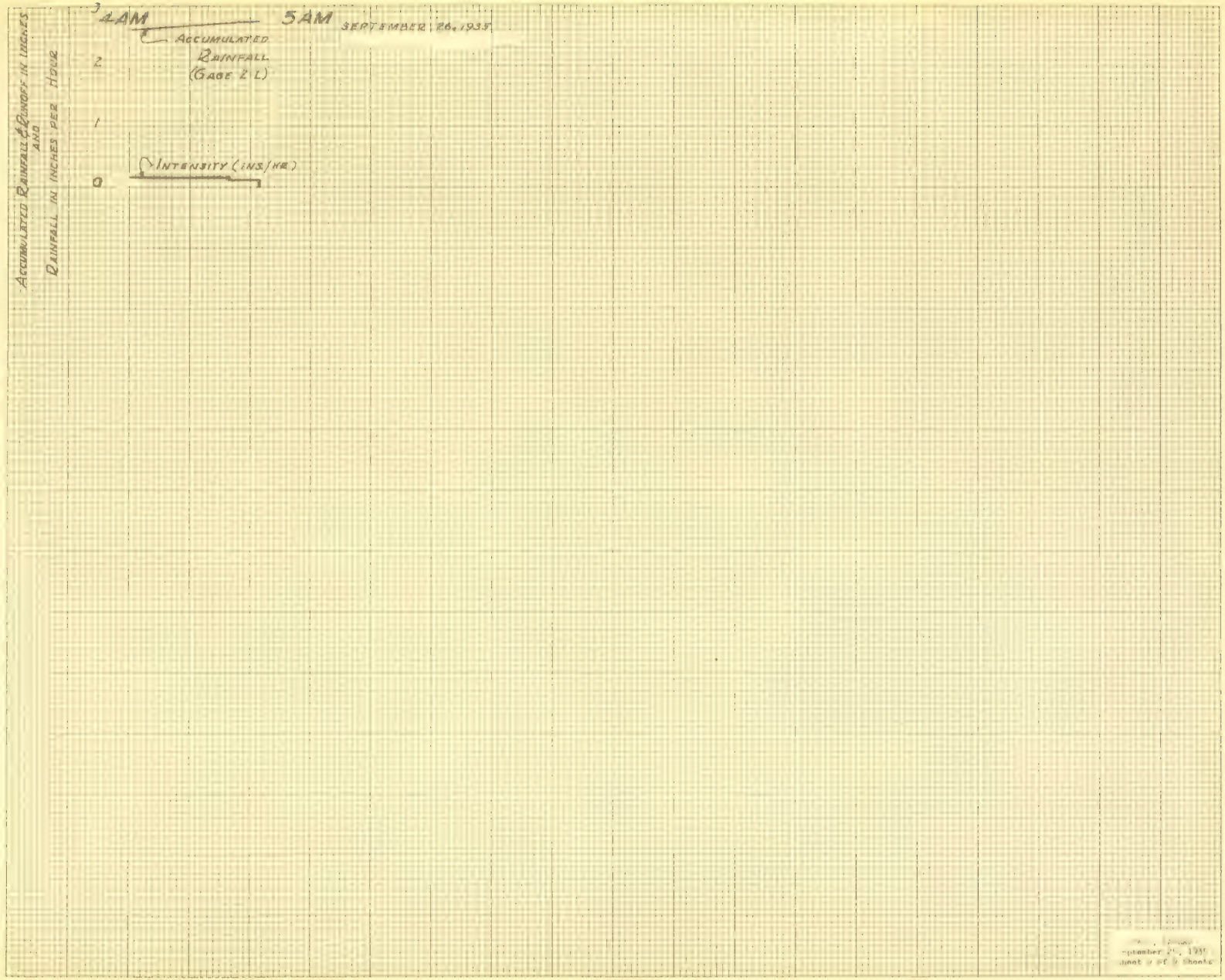
Watershed	6-L	1.61AG
Area (acres)	2.85	1.61
Preceding rain (in.)	1.17	1.08
date began	9/8	9/8
duration (hours)	14.00	14.00*
Temperature (max. & min.)	88 & 49	88 & 49
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	85
Slope, average (percent)	4-7	5-8
maximum	7	8
Cover, type	**	***
height (ft.)	0	.2-.3
date last cultivated	9/14	(Not grazed in 1935)
Soil loss (tons per acre)	6.27	.04

Remarks

*Record taken from recording gage 2-L, believed to be about the same.
**One disk plowed and subsoil packed, 9/14.
***Native buffalo and gramma grass.

HAYS, KANSAS
September 25, 1935
Sheet 7 of 9 Sheets


10PM
11PM
12M
1AM
2AM
3AM
SEPTEMBER 25,26, 1935
ACCUMULATED RAINFALL (GAGE Z-L)
ACCUMULATED RUNOFF
G-L
INTENSITY (INS./HR.)
ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
DISCHARGE IN SECOND-FEET
3
2
1
0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
RATE OF RUNOFF
G-L
HAYS, KANSAS
September 25, 1935
Sheet 8 of 9 Sheets


ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
3
2
1
0
4 AM
5 AM
SEPTEMBER 26, 1935
ACCUMULATED RAINFALL (GAGE 2 L)
INTENSITY (INS./HR.)

1936

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH January, February, March, April. , 1936

SHEET 1 OF 4 SHEETS

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	MAXIMUM INTENSITY: 5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	MAXIMUM RATE: Cu. ft. sec.	MAXIMUM RATE: Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Jan. 1			U.S.	Weather	Bureau	.03	Standard	Gage		35	31	No	Runoff						2-L Terraced Area.
																			Colby silt clay loam.
																			Average land slope 5 to 6%.
6			do	do	do	T	do		do	32	17	do		do					Vertical spacing 4 feet.
																			Grade constant 4 inches.
																			Terrace length 700 feet.
7			do	do	do	.12	do		do	18	7	do		do					Planted to barley in-kafir stubble, with no previous preparation 4/8.
17			do	do	do	T	do		do	25	14	do		do					Barley harvested 7/3.
																			One-way disc plowed 7/13, 10/12.
																			Sowed to wheat 10/12.
Feb. 1			do	do	do	T	do		do	31	7	do		do					
																			3-L. Terraced Area.
2			do	do	do	T	do		do	14	7	do		do					Colby silt clay loam.
																			Average land slope 5 to 7%.
																			Vertical spacing 4 feet.
3			do	do	do	.10	do		do	14	5	do		do					Grade constant 4 inches.
																			Terrace length 700 feet.
																			Disked 5/15.
7			do	do	do	.05	do		do	43	-1	do		do					Planted to kafir 6/2.
																			Kafir thrown out 6/13.
																			Kafir thrown in 7/1.
8			do	do	do	.05	do		do	7	-16	do		do					Cultivated 7/16.
																			Crop harvested 11/4.
9			do	do	do	T	do		do	20	-7	do		do					
																			4-L. Terraced Area.
																			Colby silt clay loam.
March 16			do	do	do	T	do		do	56	33	do		do					Average land slope 6 to 8%.
																			Vertical spacing 4 feet.
																			Grade constant 4 inches.
18			do	do	do	.01	do		do	71	36	do		do					Terrace length 700 feet.
																			Wheat harvested 6/29.
																			Basin listed on contour 7/10.
22			do	do	do	T	do		do	71	56	do		do					
31			do	do	do	.10	do		do	36	23	do		do					
Apr. 1			do	do	do	T	do		do	28	18	do		do					
2			do	do	do	.05	do		do	32	7	do		do					

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

PROJECT HAYS, KANSAS

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

MONTH April, May, 19 36

Date	Watershed		Rainfall							Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
							Maximum Intensity								Maximum Rate				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
April 6			U.S. Weather Bureau			.20	Standard Gage			55	6	No	Runoff						2-M. Terraced Area.
																			Colby silt clay loam.
10			do	do	do	.12	do		do	70	30	do		do					Average land slope 3 to 7%.
																			Vertical spacing 2 feet.
																			Grade constant level.
14			do	do	do	T	do		do	87	44	do		do					Terrace length 1600 feet.
																			Wheat harvested 6/30.
																			Basin listed 7/10.
																			Ridges busted 9/14.
21			2-L	4:03A	15	.14	.72	.56	---	57	33	do		do					One-way disk plowed 10/2
																			Seeded to wheat 10/10.
26			2-L	5:05A	110	.43	.72	.48	.40	61	44	do		do					
																			3-M. Terraced Area.
																			Colby silt clay loam.
May 5*	2-L	1.03	2-L	2:53A	36	.71	1.94	1.64	1.37	95	61	3:03A	5:48A	.119	.20	3:20A	.59	.05	Average land slope 3 to 7%.
																			Vertical spacing 3 feet.
																			Grade constant level.
5			2-L	7:38P	15	.18	1.08	.72	---	95	61	No	Runoff						Terrace length 1600 feet.
																			Wheat harvested 7/1.
																			One-way disk plowed 7/11. 9/15.
8*	2-L	1.03	2-L	8:47P	260	.90	2.16	1.24	.88	67	52	8:52P	11:18P	.187	.20	9:15P	.71	.07	Seeded to wheat 10/5.
9			2-L	12:40A	338	.29	.36	.24	.20	59	43	No	Runoff						6-L. Cultivated Area.
																			Colby silt clay loam.
																			Average land slope 4 to 7%.
11			2-L	---	15(a)	.08	---	---	---	64	50	do		do					Wheat harvested 6/29.
																			One-way disk plowed 7/14.
																			Seeded to wheat 10/5 and 10/10.
23-24			2-L	11:20A	1305	1.55	.84	.64	.54	73	59	do		do					(Rain intervened)
27			2-L	3:13P	10	.08	.72	---	---	79	59	do		do					1.61 AG. Pasture Area.
																			Colby silt clay loam.
																			Average land slope 5 to 8%.
28*	2-L	1.03	2-L	1:20P	475	1.46	4.18	2.62	1.79	76	62	3:05P	5:21P	.561	1.01	3:37P	.90	.14	Cover of native buffalo
*	3-L	.85	2-L	do	do	1.46	do	do	do	do	do	3:12P	4:31P	.170	.25	3:31P	1.29	.15	and gramma grass.
*	4-L	.87	2-L	do	do	1.46	do	do	do	do	do	3:04P	4:15P	.173	.30	3:34P	1.29	.05	Grazing begun 6/1.
*	2-M	2.81	3-M	do	do	1.46	do	do	do	do	do	3:17P	4:19P	.052	.22	3:30P	1.41	.02	ended 9/30.
*	5-M	2.95	3-M	do	do	1.46	do	do	do	do	do	3:20P	4:11P	.023	.12	3:22P	1.44	.01	Not ever grazed.
*	6-L	2.81	2-L	do	do	1.46	do	do	do	do	do	3:15P	4:04P	.075	.74	3:20P	1.38		
*	1.61AG	1.61	U.S. Weather Bureau			1.52	Standard Gage			do	do	3:18P	4:00P	.219	1.17	3:32P	1.30	.02	

(a) Estimated.
* Hydrographs plotted for these storms.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

Month June, July, August, September, October. 1936

Project HAYS, KANSAS

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Sheet 3 of 4 sheets

Date	Watershed		Rainfall							Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	Maximum Intensity: 5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate: Cu ft sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
June 4			2-L	---	---	.19	---	---	---	65	54	No Runoff							
5			2-L	6:07A	.73	.09	.24	.16	.08	79	58	do		do					
26			2-L	4:03A	194	.11	.60	.24	.16	113	77	do		do					
July 27			2-L	5:26P	127	.36	.96	.48	.28	107	81	do		do					
Aug. 4-5			2-L	11:40P	745	.31	.36	.16	.12	89	60	do		do					
6			2-L	1:30A	416	.52	.48	.28	.20	71	61	do		do					
21			2-L	2:23P	72	.64	2.64	1.52	.80	100	74	do		do					
22			2-L	3:35A	70	.12	.36	.20	.14	96	69	do		do					
27-28			2-L	11:47P	207	.35	.24	.24	.24	102	64	do		do					
Sept. 4			2-L	12:55A	477	.77	.84	.64	.42	88	68	do		do					
8			2-L	9:09P	8	.07	.60	---	---	97	63	do		do					
26-28			2-L	5:32A	3178	.83	.24	.16	.12	70	42	do		do					
28			2-L	11:15P	495	.16	.24	.12	.08	49	42	do		do					
Oct. 6			2-L	---(a)	---(a)	.88	---	---	---	75	49	do		do					
16	1.61AG	1.61	2-L	---(a)	---(a)	.57	---	---	---	65	51	2:04P	2:38P	.003	.03	2:08P	.57		Rain gage recorder pen did not ink. Hydrograph not plotted.

(a)- Recorder pen stuck.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

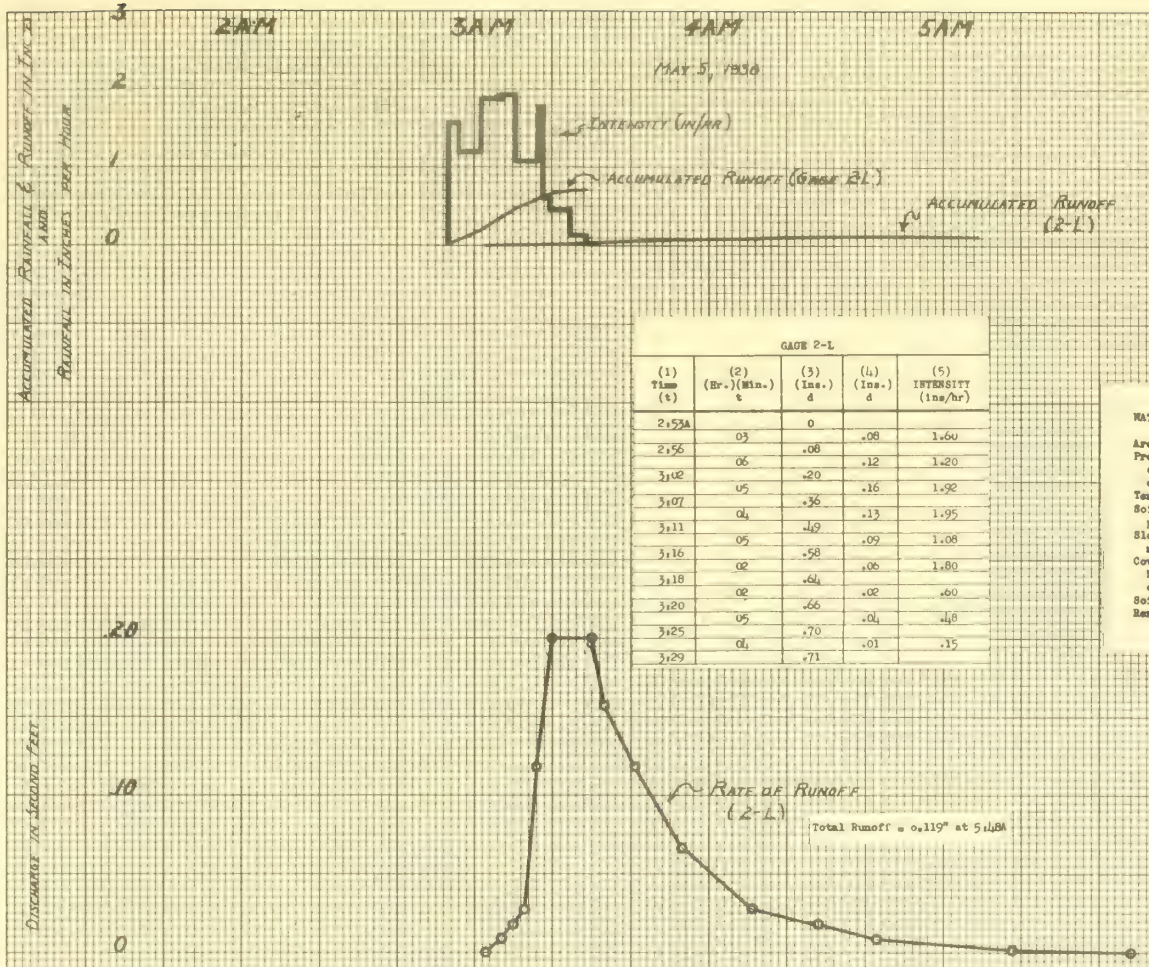
RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Project HAYS, KANSAS

Month October, November, December, 1936

Sheet 4 of 4 sheets

Date	Watershed		Rainfall							Temperature (degrees F)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	Maximum Intensity: 5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate: Cu ft sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
Oct. 24			2-L	10:32A	268	.74	.48	.36	.32	66	30	No	Runoff						
Nov. 2			U.S. Weather Bureau			T	Standard Gage			47	22	do		do					
Dec. 1			do	do	do	.06	do		do	45	30	do		do					
4			do	do	do	T	do		do	36	26	do		do					
5			do	do	do	.44	do		do	44	29	do		do					
6			do	do	do	T	do		do	29	9	do		do					
8			do	do	do	T	do		do	34	24	do		do					
17			do	do	do	T	do		do	41	30	do		do					



GAGE 2-L

(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (ins/hr)
2:53A		0		
	03		.08	1.60
2:56		.08		
	06		.12	1.20
3:02		.20		
	05		.16	1.92
3:07		.36		
	04		.13	1.95
3:11		.49		
	05		.09	1.08
3:16		.58		
	02		.06	1.80
3:18		.64		
	02		.02	.60
3:20		.66		
	05		.04	.48
3:25		.70		
	04		.01	.15
3:29		.71		

WATERSHED	2-L
Area (acres)	1.03
Preceding rain (In.)	.43
date began	4/26
duration (hours)	1.83
Temperature (max. & min.)	95 & 61
Soil (major type)	Colby Silt Clay Loam
percent of area	100
Slope, average, percent	5-6
maximum	6
Cover, type	Barley
height (ft.)	0-.2
date last cultivated	4/8/36
Soil loss (tons per acre)	.05
Remarks	

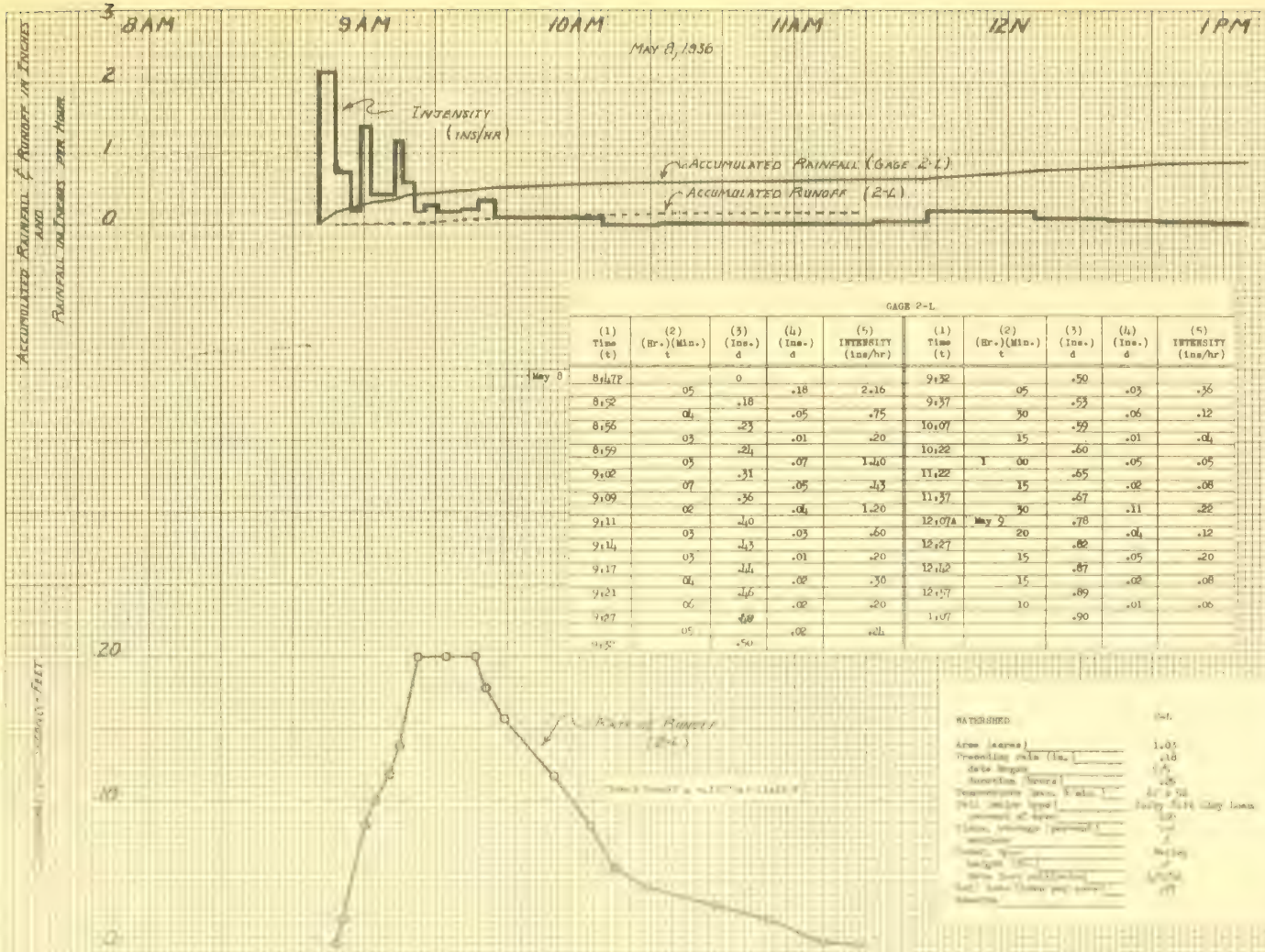
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO.____ MAY 5, 1936

Plot by S.A.M. date 10-39 checked by_____date_____
Computations by S.A.M. date 10-39 checked by_____date_____.

Sheet 1 of 1 sheet



GAGE 2-L

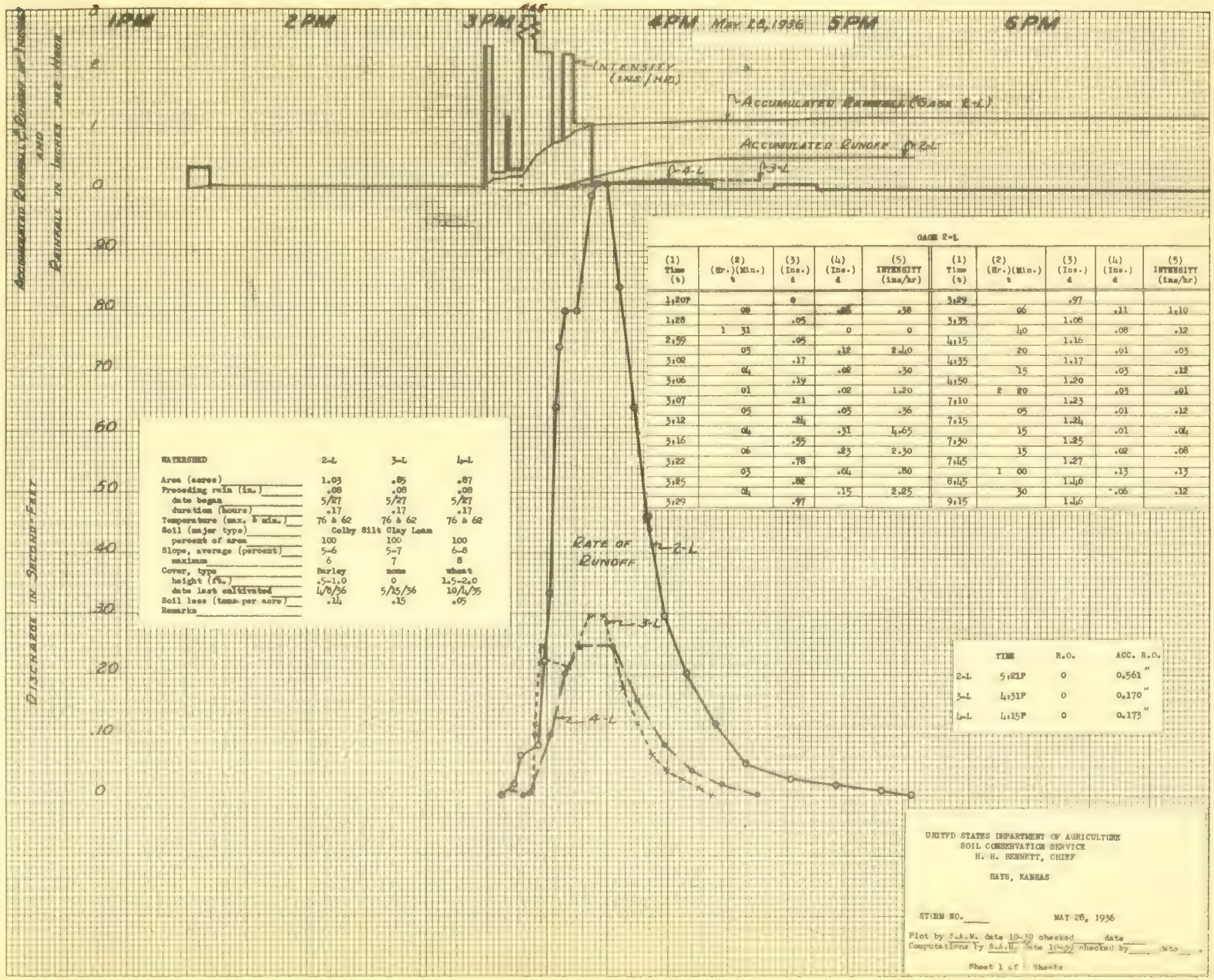
(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (ins/hr)	(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (ins/hr)
May 8 8:47		0			9:32		.50		
	05	.18	.18	2.16		05	.53	.03	.36
8:52	04	.23	.05	.75	9:37	30	.59	.06	.12
8:56	03	.24	.01	.20	10:07	15	.60	.01	.04
8:59	03	.31	.07	1.40	10:22	1 00	.65	.05	.05
9:02	07	.36	.05	.43	11:22	15	.67	.02	.08
9:09	02	.40	.04	1.20	11:37	30	.78	.11	.22
9:11	03	.43	.03	.60	12:07A May 9	20	.82	.04	.12
9:14	03	.44	.01	.20	12:27	15	.87	.05	.20
9:17	04	.46	.02	.30	12:42	15	.89	.02	.08
9:21	06	.48	.02	.20	12:57	10	.90	.01	.06
9:27	05	.50	.02	.24	1:07				
9:32									

WATERSHED

Area (acres)	1.03
Preceding rain (In.	.18
date began	5
duration, hours	.25
Temperature (max. & min.)	82 & 58
Soil cover type	Fairly thin clay loam
percent of area	100
Tillage, drainage (percent)	Good
antecedent	A
Crop, % by	Barley
height	2"
Storm Runoff (Inches)	1.00/24
Soil temp. (Inches per hour)	.49
Remarks	

Plot By R.A.H. date 10-31 checked by _____ date _____
Computations by R.H.H. date 10-31 checked by _____ date _____

Sheet 1 of 1 sheet



WATERSHED	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding rain (in.)	.08	.08	.08
date began	5/27	5/27	5/27
duration (hours)	.17	.17	.17
Temperature (max. & min.)	76 & 62	76 & 62	76 & 62
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	Barley	none	Wheat
height (ft.)	.5-1.0	0	1.5-2.0
date last cultivated	4/8/36	5/15/36	10/4/35
Soil loss (tons per acre)	.14	.15	.05
Remarks			

GAGE 2-L

(1) Time (h)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (ins/hr)	(1) Time (h)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) INTENSITY (ins/hr)
1:20P		0			3:29		.97		
	08		.08	.38		06		.11	1.10
1:28		.05			3:35		1.08		
	1 31		0	0		40		.08	.12
2:59		.05			4:15		1.16		
	03		.12	2.40		20		.01	.03
3:02		.17			4:35		1.17		
	04		.08	.30		15		.03	.12
3:06		.19			4:50		1.20		
	01		.02	1.20		2 20		.03	.01
3:07		.21			7:10		1.23		
	05		.03	.36		05		.01	.12
3:12		.24			7:15		1.24		
	04		.31	4.65		15		.01	.04
3:16		.55			7:30		1.25		
	06		.23	2.30		15		.02	.08
3:22		.78			7:45		1.27		
	03		.04	.80		1 00		.13	.13
3:25		.82			8:45		1.40		
	04		.15	2.25		30		.06	.12
3:29		.97			9:15		1.46		

	TIME	R.O.	ACC. R.O.
2-L	5:21P	0	0.561 "
3-L	4:31P	0	0.170 "
4-L	4:15P	0	0.173 "

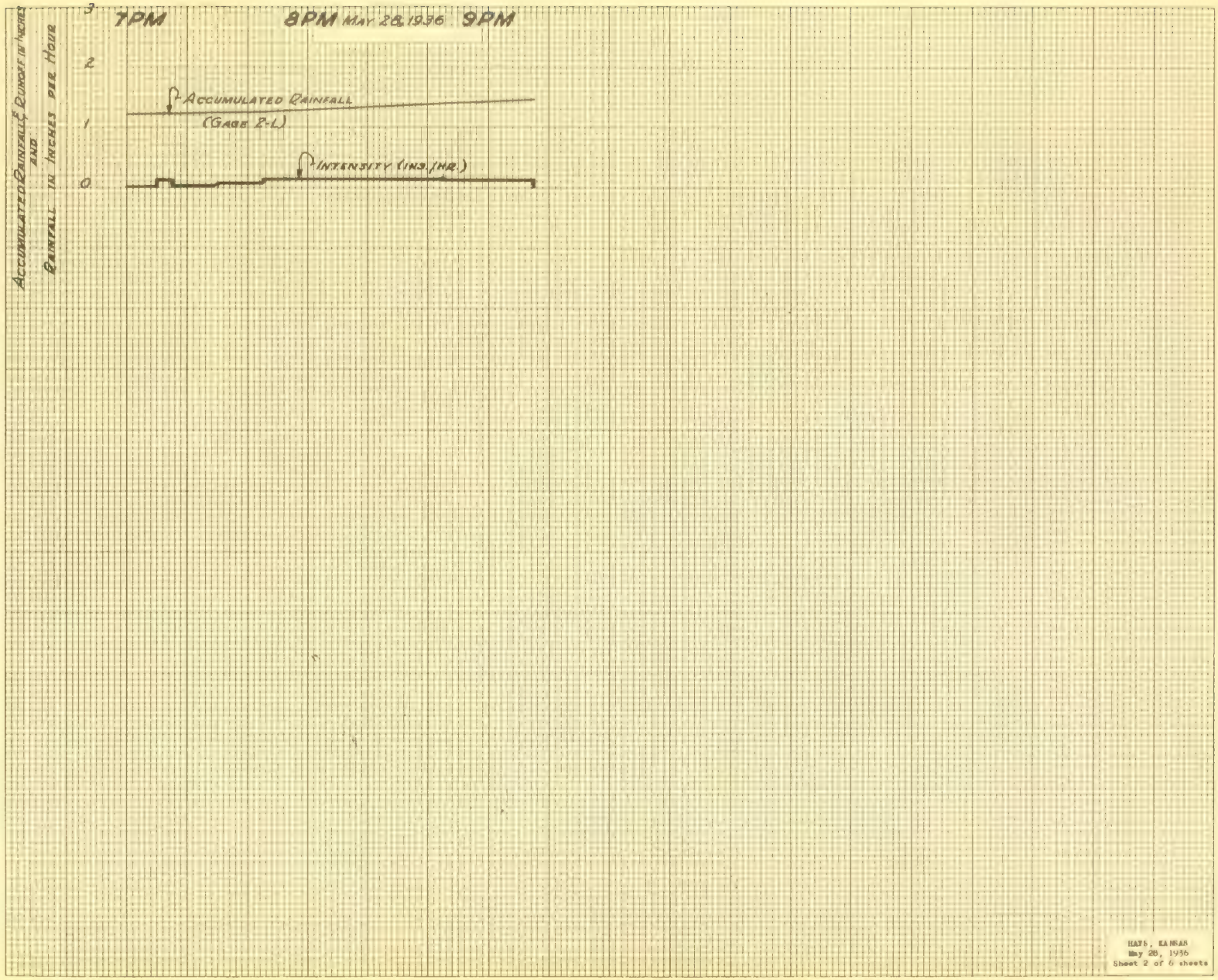
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

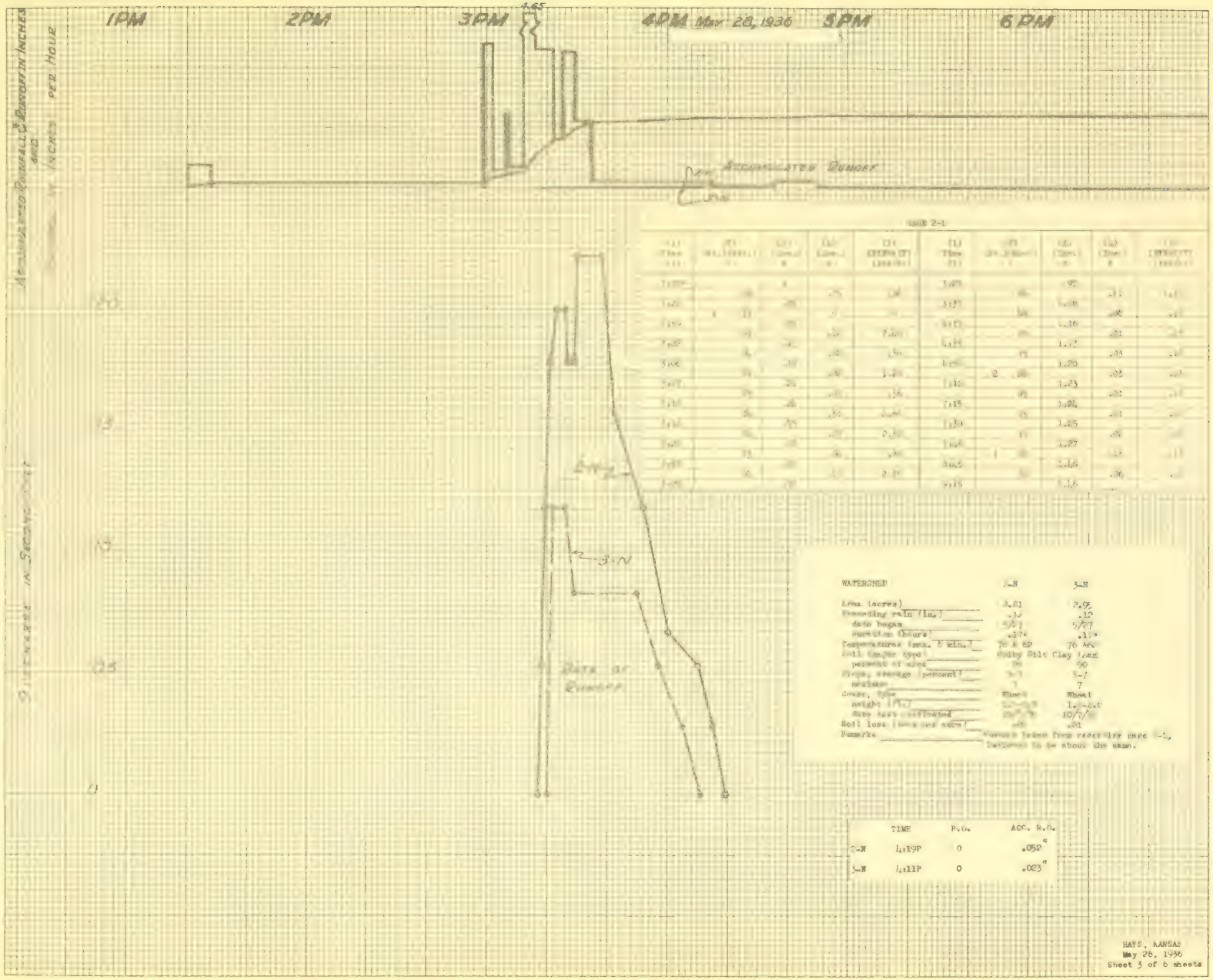
STORM NO.____ MAY 28, 1936

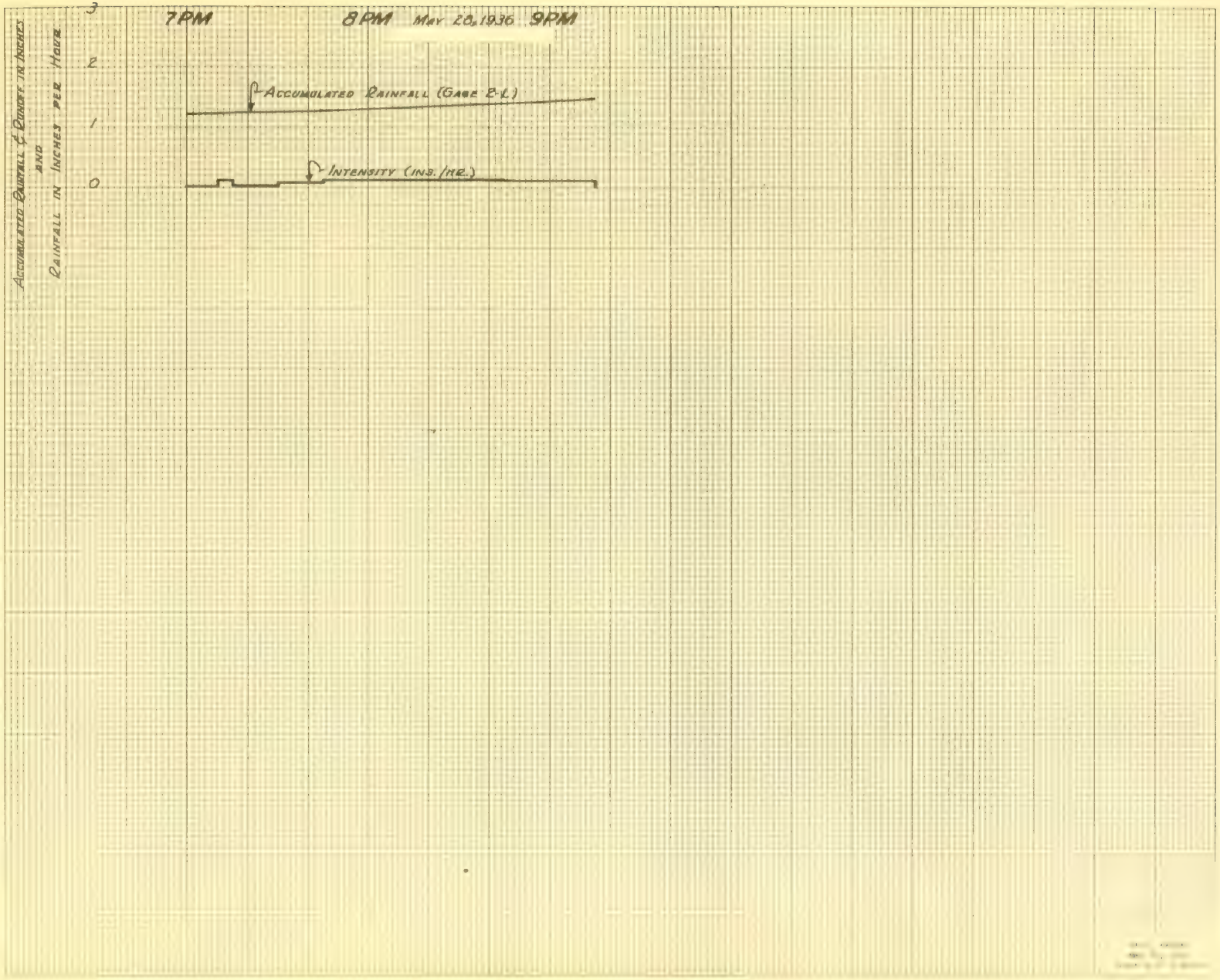
Plot by S.A.M. date 10-30 checked ____ date ____
Computations by S.A.M. date 10-30 checked by ____ date ____

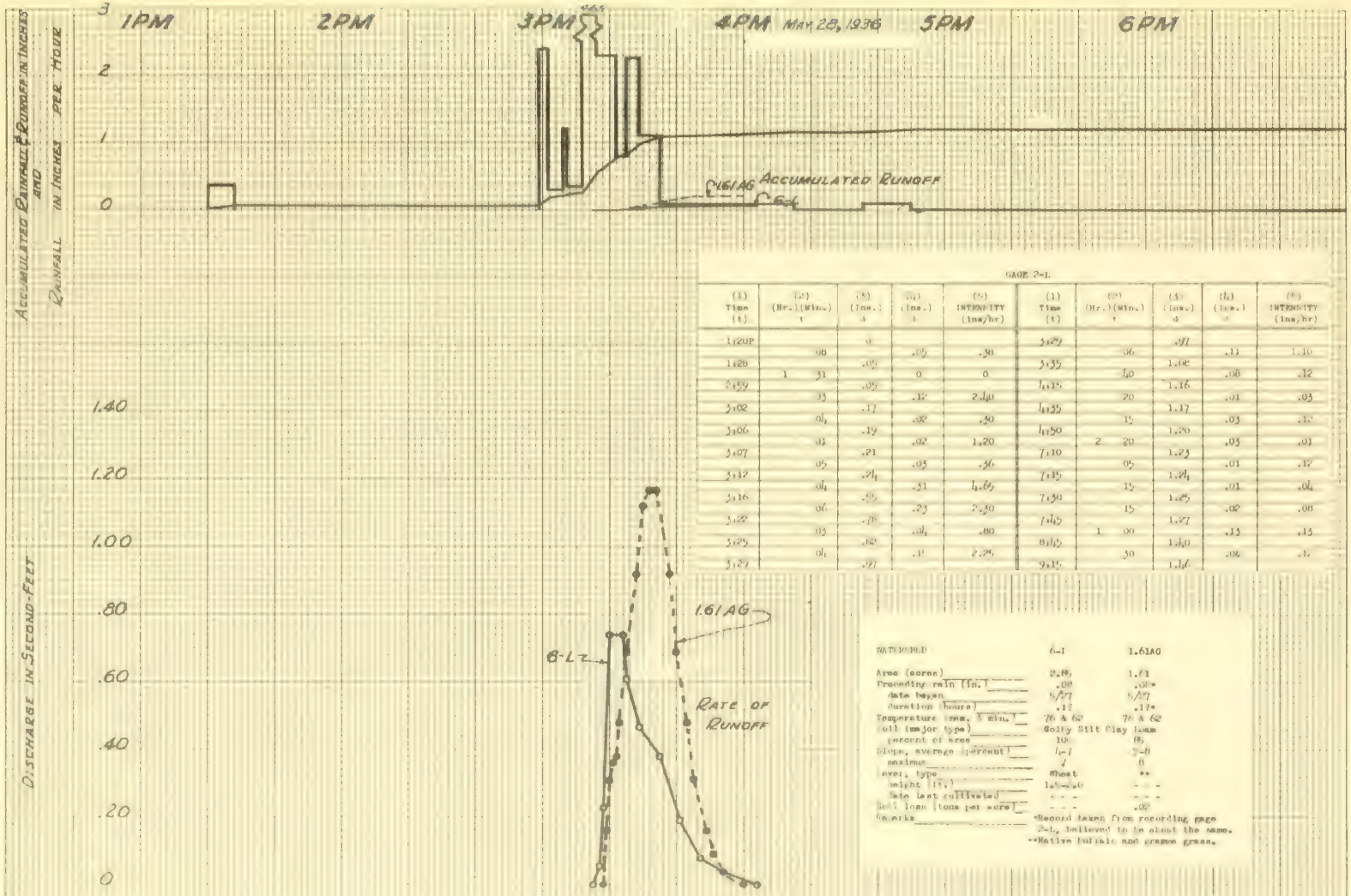
Sheet 1 of 1 Sheets



HAYS, KANSAS
May 28, 1936
Sheet 2 of 6 sheets


1PM
2PM
3PM
4PM
Mar 28, 1936
5PM
6PM
Accumulated Runoff
Rate of Rainfall
Accumulated Rainfall & Runoff in Inches and Rate of Rainfall in Inches per Hour
2-N
3-N
Rate of Runoff
PAGE 2-L
WATERSHED
1-N
3-N
Area (acres)
3.81
3.98
Preceding rain (in.)
.12
.10
date began
5/27
5/27
duration (hours)
.17+
.17+
Temperatures (max. & min.)
76 & 62
76 &
Soil (major type)
Colby Silt Clay Loam
percent of area
90
Slope, average (percent)
3-7
3-7
maximum
7
Cover, type
Fallow
Wheat
height (in.)
1.-2.0
date last cultivated
10/1/
Soil loss (tons per acre)
.01
Remarks
Rainfall taken from recording gage 1-L, Rainfall to be about the same.
TIME
R.O.
ACC. R.O.
2-N
4:19P
0
.052a
3-N
4:11P
0
.023a
HAYS, KANSAS
May 28, 1936
Sheet 3 of 6 sheets


Accumulated Rainfall & Runoff in Inches and Rainfall in Inches per Hour
3
2
1
0
7PM
8PM
May 28, 1936
9PM
Accumulated Rainfall (Gage E-L)
Intensity (Ins./Hr.)

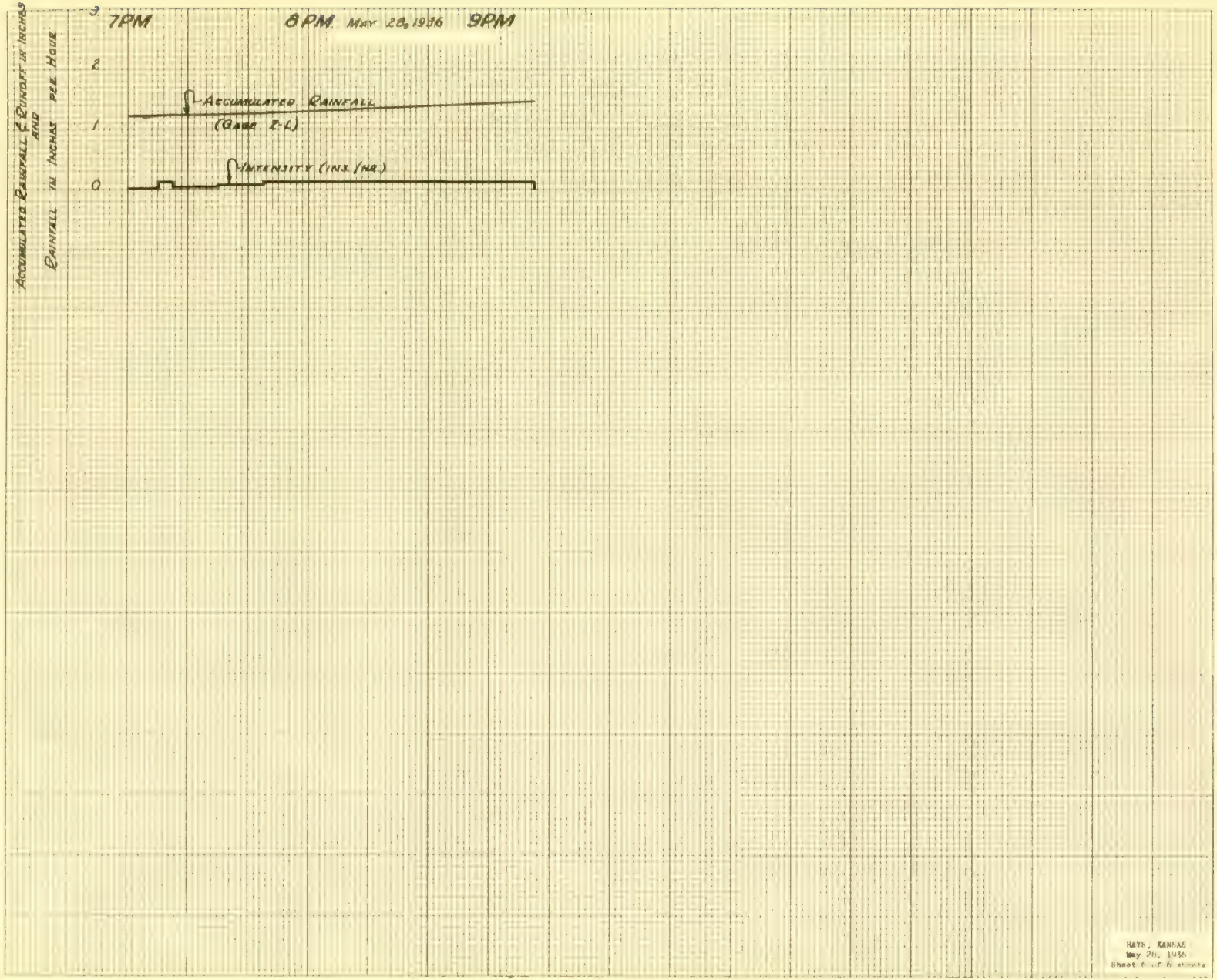


GAGE 6-1

(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) i	(5) INTENSITY (ins/hr)	(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) i	(5) INTENSITY (ins/hr)
1:20P		0			5:25		.71		
1:28	:08	.05	.05	.38	5:35	:06	1.08	.11	1.10
1:59	1 :31	.05	0	0	1:45	:10	1.16	.08	.12
2:02	:03	.17	.12	2.40	1:55	:20	1.17	.01	.03
2:06	:04	.19	.02	.30	1:50	:15	1.20	.03	.12
2:07	:01	.21	.02	1.20	2 :20	:30	1.23	.03	.01
2:12	:05	.21	.03	.36	7:10	:05	1.23	.01	.12
2:16	:04	.31	1.69	7:35	:15	1.24	.01	.04
2:22	:06	.35	.25	7:30	:15	1.25	.02	.08
2:25	:03	.38	.80	7:45	1 :00	1.27	.13	.13
2:29	:04	.42	.1	2.75	8:45	:30	1.40	.06	.1
2:29		.71			9:15		1.46		

WATERSHED	6-1	1.61AG
Area (acres)	2.85	1.61
Preceding rain (in.)	.08	.08*
date began	5/27	5/27
duration (hours)	.17	.17*
Temperature (max. & min.)	76 & 62	76 & 62
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	85
Slope, average (percent)	1-4	2-8
maximum	4	8
Cover, type	Wheat	**
height (ft.)	1½-2.0	- - -
date last cultivated	- - -	- - -
Soil loss (tons per acre)	- - -	.02
Remarks		

*Record taken from recording gage 2-1½, believed to be about the same.
**Native buffalo and grama grass.


ACCUMULATED RAINFALL, & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
3
2
1
0
7PM
8PM
MAY 28, 1936
9PM
ACCUMULATED RAINFALL
(CURVE E-L)
INTENSITY (INS./HR.)
HAYS, KANSAS
May 28, 1936
Sheet 6 of 6 sheets

1937

Form S. C. S.-315

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month January, February, March, 1937

Project HAYS, KANSAS

Sheet 1 of 5 sheets

Date	Watershed		Rainfall							Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	Maximum Intensity: 5 minutes (inches per hour)	Maximum Intensity: 15 minutes (inches per hour)	Maximum Intensity: 30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate: Cu ft sec	Maximum Rate: Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
January 1			U. S.	Weather	Bureau	.06	Standard	Gage		47	27	No	Runoff						2-L. Terraced Area.
																			Colby Silt Clay Loam
2			do	do	do	.06	do		do	31	8	do		do					Average land slope 5 to 6%.
																			Vertical spacing 4 feet.
																			Grade constant 4 inches.
6			do	do	do	T	do		do	37	5	do		do					Terrace length 700 feet.
																			Wheat harvested 7/1.
																			Basin listed 7/14.
7			do	do	do	.30	do		do	5	-2	do		do					Ridges busted 8/24.
																			Thistles cut with shovels 9/9.
																			Basin listed 10/26.
8			do	do	do	.25	do		do	3	-5	do		do					
																			3-L, Terraced Area.
																			Colby Silt Clay Loam.
20			do	do	do	T	do		do	28	7	do		do					Average land slope 5 to 7%.
																			Vertical spacing 4 feet.
																			Grade constant 4 inches.
21			do	do	do	.20	do		do	9	0	do		do					Terrace length 700 feet.
																			Planted to barley 3/11.
29			do	do	do	.05	do		do	22	10	do		do					One way plowed 7/7.
																			Duckfooted and packed 9/21.
																			Sowed to wheat 9/22.
30			do	do	do	.01	do		do	22	11	do		do					
																			4-L. Terraced Area.
																			Colby Silt Clay Loam
31			do	do	do	.01	do		do	13	5	do		do					Average land slope 6 to 8%.
																			Vertical spacing 4 feet.
																			Grade constant 4 inches.
February 8			do	do	do	T	do		do	32	11	do		do					Terrace length 700 feet.
																			Duckfooted 5/15.
																			Harrowed 6/5.
17			do	do	do	T	do		do	53	35	do		do					Planted to Kafir 6/16.
																			Thinned Kafir 7/1.
																			Cultivated 8/2.
20			do	do	do	.24	do		do	39	30	do		do					Kafir harvested 10/11.
																			Basin listed 11/29.
26			do	do	do	.10	do		do	23	16	do		do					
27			do	do	do	.05	do		do	25	17	do		do					
March 4			do	do	do	T	do		do	54	42	do		do					

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

Month March, April, May, 19 37

Project HAYS, KANSAS

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Sheet 2 of 5 sheets

Date	Watershed: Number	Watershed: Area (acres)	Rainfall: Gage No.	Rainfall: Began (hour)	Rainfall: Duration (minutes)	Rainfall: Amount (inches)	Rainfall: Maximum Intensity: 5 minutes (inches per hour)	Rainfall: Maximum Intensity: 15 minutes (inches per hour)	Rainfall: Maximum Intensity: 30 minutes (inches per hour)	Temperature (degrees F.): Maximum	Temperature (degrees F.): Minimum	Run-off: Began (hour)	Run-off: Ended (hour)	Run-off: Amount (inches)	Run-off: Maximum Rate: Cu. ft. sec.	Run-off: Maximum Rate: Time	Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
March 12			U. S. Weather Bureau			.06		Standard Gage		44	28		No Runoff						2-N. Terraced Area.
																			Colby Silt Clay Loam.
																			Average land slope 3 to 7%.
13			do	do	do	.12	do		do	30	25	do		do					Vertical spacing 2 feet.
																			Grade constant level.
																			Terrace length 1600 feet.
14			do	do	do	.05	do		do	27	17	do		do					Wheat harvested 7/2 and 7/7.
																			Basin listed 7/13.
																			Ridge busted 8/27.
19			do	do	do	.06	do		do	51	32	do		do					Duckfooted and packed 9/18.
																			Sowed to wheat 9/24.
20			do	do	do	.01	do		do	58	26	do		do					
																			3-N. Terraced Area.
																			Colby Silt Clay Loam.
24			do	do	do	.03	do		do	57	32	do		do					Average land slope 3 to 7%.
																			Vertical spacing 3 feet.
																			Grade constant level.
27			do	do	do	T	do		do	35	16	do		do					Terrace length 1600 feet.
																			Wheat harvested 7/2 and 7/7.
																			One way plowed 7/9.
29			do	do	do	.04	do		do	37	25	do		do					Thistles cut with shovels,
																			8/11 and 8/20.
																			One way plowed 9/3.
30			do	do	do	.06	do		do	51	21	do		do					Duckfooted and packed. 9/18.
																			Sowed to wheat 9/24.
April 1			do	do	do	.20	do		do	64	31	do		do					
																			6-L. Cultivated Area.
																			Colby Silt Clay Loam.
7			do	do	do	.14	do		do	57	40	do		do					Average land slope 4 to 7%.
																			Wheat harvested 7/2 and 7/7.
																			One way plowed 7/7.
23			do	do	do	T	do		do	90	37	do		do					Thistles cut with shovels 8/12.
																			One way plowed 9/31.
			do	do	do	T	do		do	80	46	do		do					Duckfooted and packed 9/17.
																			Sowed to wheat 9/23.
May 1			do	do	do	.36	do		do	84	46	do		do					
			2-L	4:55 P	10	.24	.16	.10		89	48	do		do					
6			2-L	4:55A	50	.10	.24	.16	.12	72	52	do		do					

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH May, June, July, 1937

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUNOFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
May 8			2-L	12:25P	40	.21	1.08	.48	.24	70	51	No Runoff							1.61 AG. Pasture Area. Colby Silt Clay Loam. Average land slope 5 to 8%. Cover of native buffalo, and gramma grass. Grazing begun 6/1. ended 9/1. Not over grazed.
9			2-L	7:00A	40	.08	.24	.20	.10	68	47	do		do					
21			2-L	---	20(a)	.35	Recorder Pen Stuck			90	62	do		do					
26			2-L	6:10P	05	.02	.24			88	57	do		do					
29			2-L	5:30P	155	.35	.24	.24	.24	88	64	do		do					
										83	60	do		do					
June 1			2-L	2:43A	90	.32	1.20	.96	.66	84	60	do		do					
1-2*	2-L	1.03	2-L	10:10P	225	1.05	3.43	2.02	1.24	84	60	10:16P	11:40P	.184	.37	10:30P	.87		
2*	2-L	1.03	2-L	1:02P	43	.39	1.20	.90	.56	79	61	1:25P	2:45P	.074	.10	1:37P	.28	.15	
5	2-L	1.03	Recorder pen did not ink			.73	---	---	---	77	52	5:22P	6:39P	.271	.64	5:30P	.46	.09	
	6-L	1.03				.72	---	---	---	do	do	5:23P	6:21P	.240	3.08	5:30P	.49	.22	
	1.61A	1.61				.77	Standard Gage			do	do	5:14P	5:55	.138	.97	5:23P	.63	.02	
15			2-L			.32	Pen did not ink			74	63	No Runoff							
July 3			2-L	1:00A	45	.06	.24	.08	.04	96	65	do		do					
10			2-L	12:30P	35	.45	1.80	1.48	.86	92	68	do		do					
10			2-L	4:57P	105	.58	1.32	.60	.36	92	68	do		do					
15			2-L	---	---	.04	---	---	---	104	65	do		do					

(a) Estimated

* Hydrographs plotted for these storms.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH July, August, September, October, 1937

SHEET 4 OF 5 SHEETS

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu ft per sec	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
July 16			2-L	3:20A	90	.26	1.20	.44	.24	96	66	No	Runoff						
17			2-L	4:45A	65	.19	.36	.32	.18	85	66	do		do					
19			2-L	12:50P	55	.24	1.80	.80	.44	90	65	do		do					
20			2-L	8:45P	55	.22	.84	.60	.38	90	62	do		do					
24*	2-L	1.03	2-L	12:45A	125	2.45	5.04	3.32	2.77	97	66	1:02A	2:50A	.490	1.35	1:15A	1.96	1.15	
*	3-L	.85	2-L	do	do	2.45	do	do	do	do	do	12:50A	2:57A	.664	1.11	1:22A	1.79	1.34	
*	4-L	.37	2-L	do	do	2.45	do	do	do	do	do	12:47A	2:47A	1.421	2.63	1:15A	1.03	3.31	
*	2-N	6.81	3-N	do	do	2.48	do	do	do	do	do	12:45A	2:13A	.039	.35	1:25A	2.44	.08	
*	3-N	2.96	3-N	do	do	2.48	do	do	do	do	do	12:49A	2:35A	.174	1.27	1:13A	2.31	.20	
*	6-L	2.85	3-L	do	do	2.45	do	do	do	do	do	12:50A	2:15A	1.297	13.80	1:03A	1.15	6.41	
*	1.61AG	1.61	U.S. Weather Bureau			2.57	Standard Gage				do	do	12:46A	1:51A	.743	3.18	1:02A	1.83	0
August 18*	2-L	1.03	2-L	12:38A	157	2.70	3.99	1.91	1.41	92	65	12:58A	4:51A	.809	.95	3:04A	1.89	.68	
*	3-L	.85	2-L	do	do	2.70	do	do	do	do	do	12:57A	5:12A	1.257	.84	2:57A	1.44	.99	
*	4-L	.37	2-L	do	do	2.70	do	do	do	do	do	1:03A	5:08A	1.097	1.11	2:57A	1.60	1.58	
*	2-N	6.81	3-N	do	do	2.67	do	do	do	do	do	12:58A	4:50A	.316	.88	3:08A	2.35	.18	
*	3-N	2.96	3-N	do	do	2.67	do	do	do	do	do	1:00A	5:04A	.329	.64	2:24A	2.33	.20	
*	6-L	2.85	2-L	do	do	2.70	do	do	do	do	do	12:59A	5:53A	2.230	11.60	2:18A	.47	11.45	
*	1.61AG	1.61	U.S. Weather Bureau			2.70	Standard Gage				do	do	1:24A	3:42A	.716	2.22	2:57A	1.98	.11
Sept. 4			2-L	2:15A	100	.18	.24	.16	.14	87	68	No	Runoff						
4			2-L	12:00N	45	.42	1.44	1.04	.70	87	68	do		do					
9*	6-L	2.85	2-L	9:55P	55	.70	3.12	1.68	.84	91	66	10:04P	11:42P	.227	3.72	10:50P	.47	1.64	
October 1			2-L	8:55A	15	.09	.48	.36	---	77	54	No	Runoff						
12			2-L	---	---	.55	Pen did not ink			74	38	No	Runoff						

* Hydrographs plotted for these storms.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

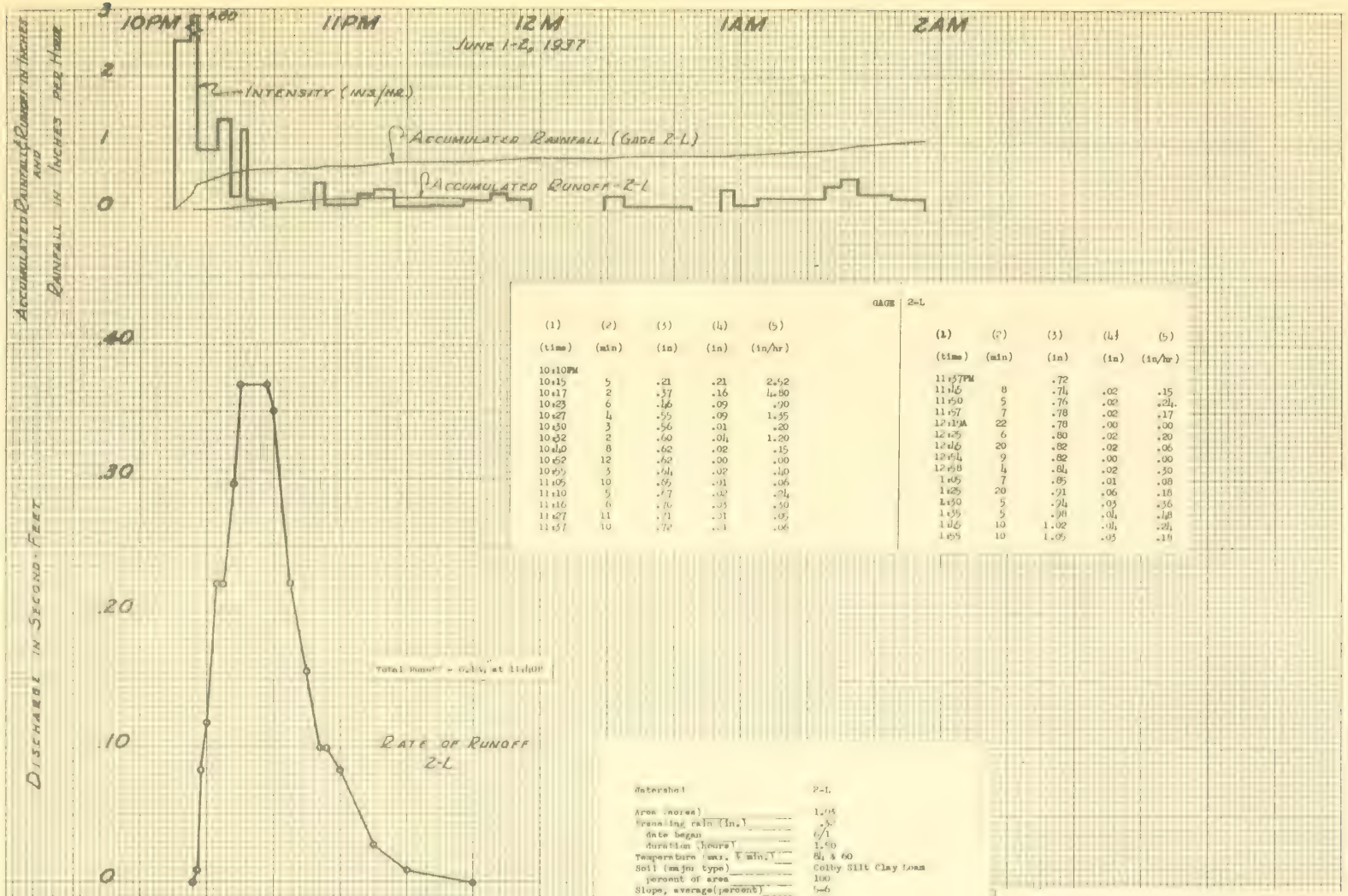
RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month October, November, December, 1937

Project HAYS, KANSAS

Sheet 5 of 5 sheets

Date	Watershed		Rainfall				Maximum Intensity			Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate Cu ft sec.	Maximum Rate Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
October 16			2-L	2:20A	375	.70	.36	.20	.12	51	42	No	Runoff						
17			2-L	---	---	.02	---	---	---	70	39	do		do					
18			2-L	---	---	.06	---	---	---	59	39	do		do					
21			U.S. Weather Bureau			T	Standard Gage			59	45	do		do					
Nov. 15			do	do	do	.25	do		do	47	27	do		do					
18			do	do	do	.05	do		do	28	17	do		do					
21			do	do	do	.05	do		do	26	21	do		do					
22			do	do	do	T	do		do	38	22	do		do					
27			do	do	do	.05	do		do	49	27	do		do					
29			do	do	do	T	do		do	37	18	do		do					
Dec. 6			do	do	do	T	do		do	29	6	do		do					
7			do	do	do	.15	do		do	36	18	do		do					
12			do	do	do	T	do		do	36	26	do		do					
13			do	do	do	.02	do		do	33	23	do		do					
14			do	do	do	.01	do		do	27	21	do		do					



GAGE 2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
10:10PM				
10:15	5	.21	.21	2.52
10:17	2	.37	.16	4.80
10:23	6	.46	.09	.90
10:27	4	.55	.09	1.35
10:30	3	.56	.01	.20
10:32	2	.60	.04	1.20
10:40	8	.62	.02	.15
10:52	12	.62	.00	.00
10:59	3	.64	.02	.40
11:05	10	.69	.01	.06
11:10	5	.77	.02	.24
11:16	6	.80	.03	.30
11:27	11	.81	.01	.05
11:37	10	.72	.09	.06

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
11:37PM		.72		
11:46	8	.74	.02	.15
11:50	5	.76	.02	.24
11:57	7	.78	.02	.17
12:19A	22	.78	.00	.00
12:25	6	.80	.02	.20
12:46	20	.82	.02	.06
12:54	9	.82	.00	.00
12:58	4	.84	.02	.30
1:05	7	.85	.01	.08
1:25	20	.91	.06	.18
1:30	5	.94	.03	.36
1:35	5	.98	.04	.48
1:46	10	1.02	.04	.24
1:55	10	1.05	.03	.18

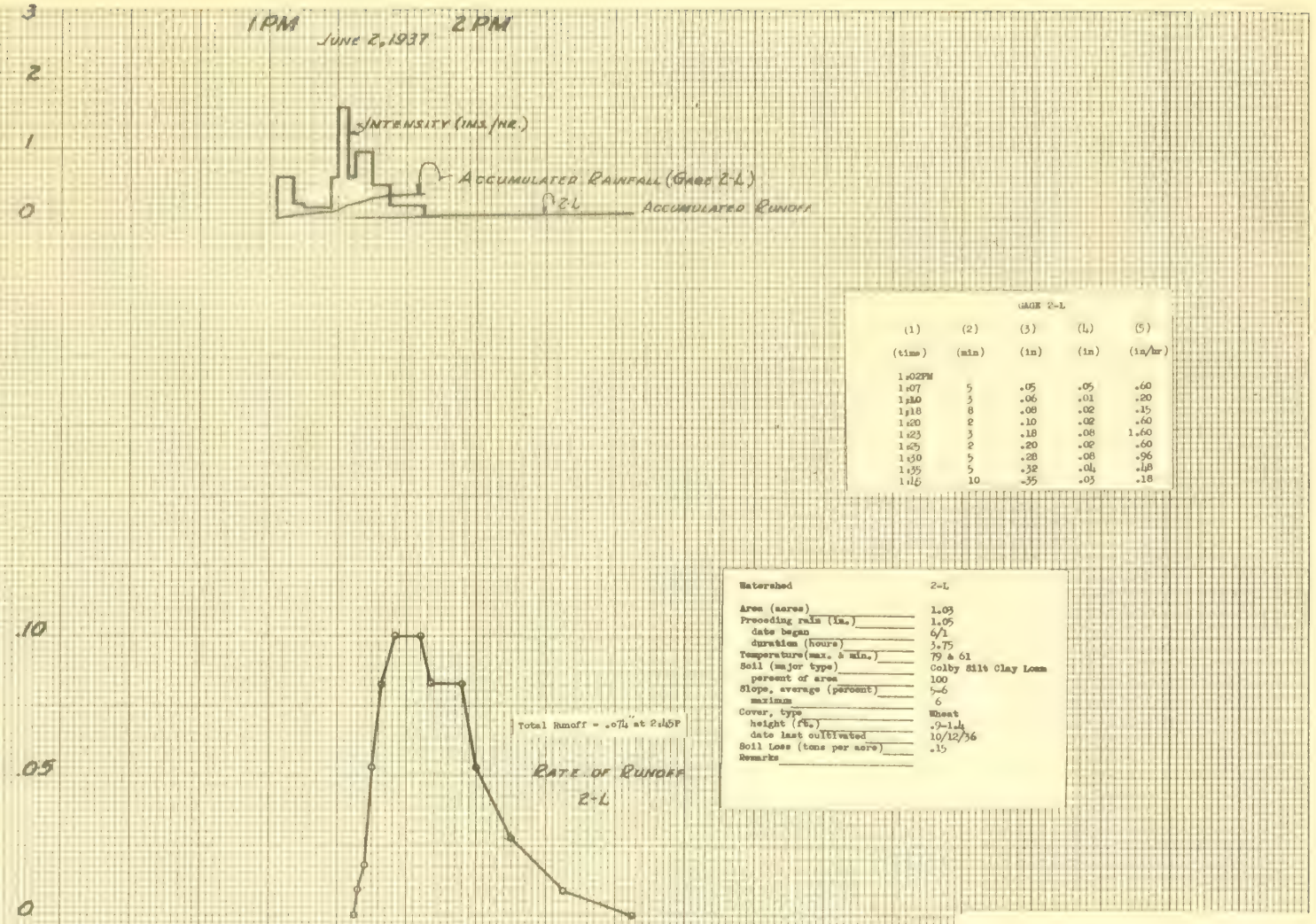
Watershed	2-L
Area (acres)	1.05
Preceding rain (in.)	.35
date began	6/1
duration (hours)	1.50
Temperature (max. F min.)	84 & 60
Soil (series type)	Colby Silt Clay Loam
percent of area	100
Slope, average (percent)	5-6
maximum	6
Cover, type	Wheat
height (ft.)	.9-1.4
date last cultivated	10/12/36
Soil loss (tons per acre)	*
Remarks	*Recorded with storm of June 2.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO.____ June 1-2, 1937

Plot by S.A.M. date 2-40 checked by R.O.B. date 2-40
Computations by S.A.M. date 2-40 checked by R.O.B. date 2-40
Sheet 1 of 1 Sheets



GAGE 2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
1:02PM				
1:07	5	.05	.05	.60
1:10	3	.06	.01	.20
1:18	8	.08	.02	.15
1:20	2	.10	.02	.60
1:23	3	.18	.08	1.60
1:25	2	.20	.02	.60
1:30	5	.28	.08	.96
1:35	5	.32	.04	.48
1:46	10	.35	.03	.18

Watershed	2-L
Area (acres)	1.03
Preceding rain (in.)	1.05
date began	6/1
duration (hours)	3.75
Temperature (max. & min.)	79 & 61
Soil (major type)	Colby Silt Clay Loam
percent of area	100
Slope, average (percent)	5-6
maximum	6
Cover, type	Wheat
height (ft.)	.9-1.4
date last cultivated	10/12/36
Soil Loss (tons per acre)	.15
Remarks	

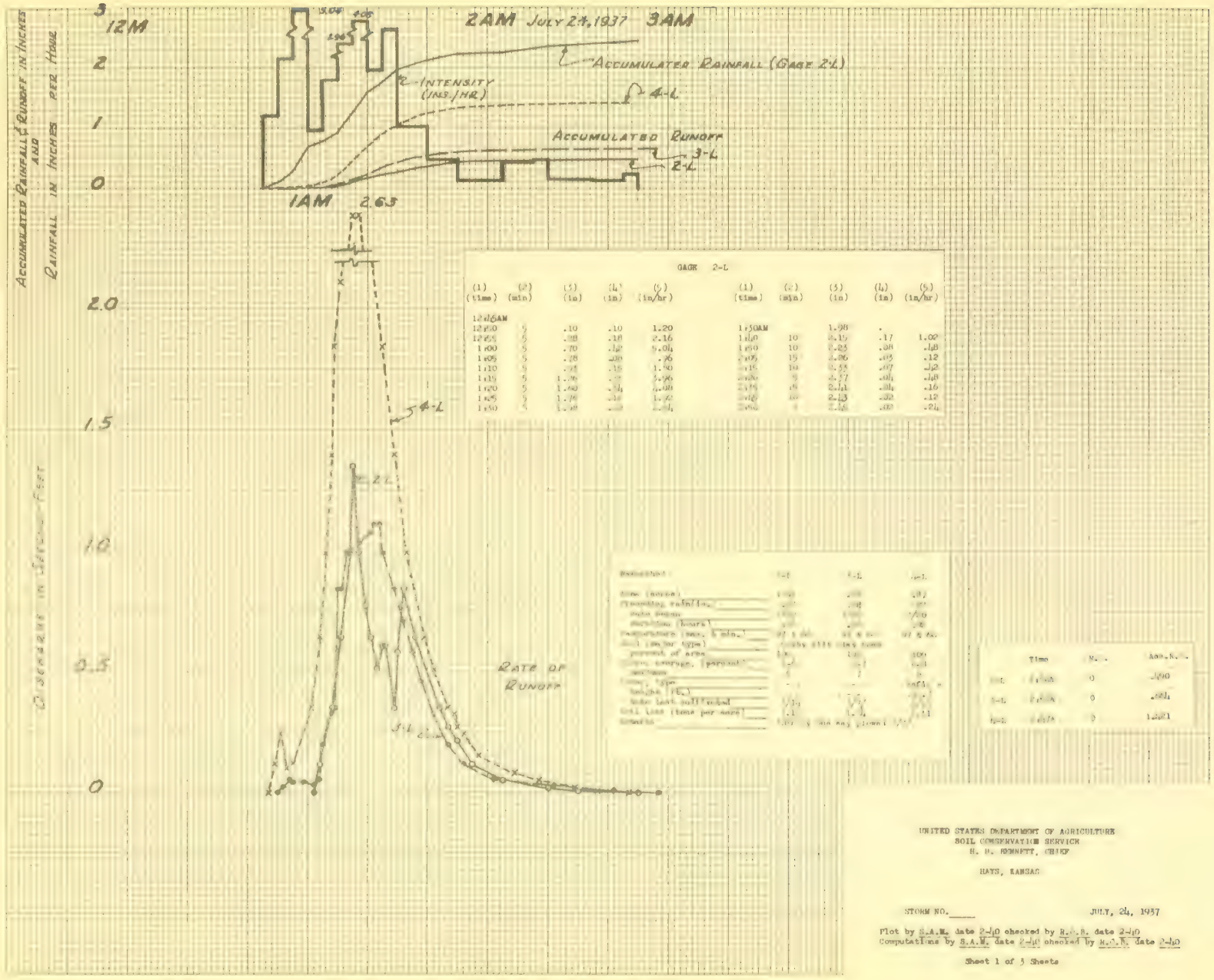
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO. ___ JUNE 2, 1937

Plot by S.A.M. Date 7-40 Checked by L...N. Date 7-40
Computations by L.A.N. Date 7-40 Checked by L... T. Date 7-40

Sheet 1 of 1 Sheets



GAGE 2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)	(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
12:56AM					1:50AM		1.98		
12:50	5	.10	.10	1.20	1:40	10	2.15	.17	1.02
12:55	5	.18	.18	2.16	1:50	10	2.23	.08	.48
1:00	5	.70	.52	5.04	1:55	15	2.36	.13	.12
1:05	5	.78	.08	.96	2:05	15	2.55	.19	.12
1:10	5	.93	.15	1.80	2:15	10	2.55	.07	.42
1:15	5	1.06	.13	1.56	2:20	5	2.57	.02	.24
1:20	5	1.40	.34	4.08	2:25	5	2.61	.04	.16
1:25	5	1.78	.38	4.56	2:40	15	2.63	.02	.12
1:30	5	1.98	.20	2.04	2:50	5	2.65	.02	.24

	Time	M....	Acc. R....
I-L	1:..A	0	.490
4-L	2:..A	0	.084
3-L	2:..A	0	1.221

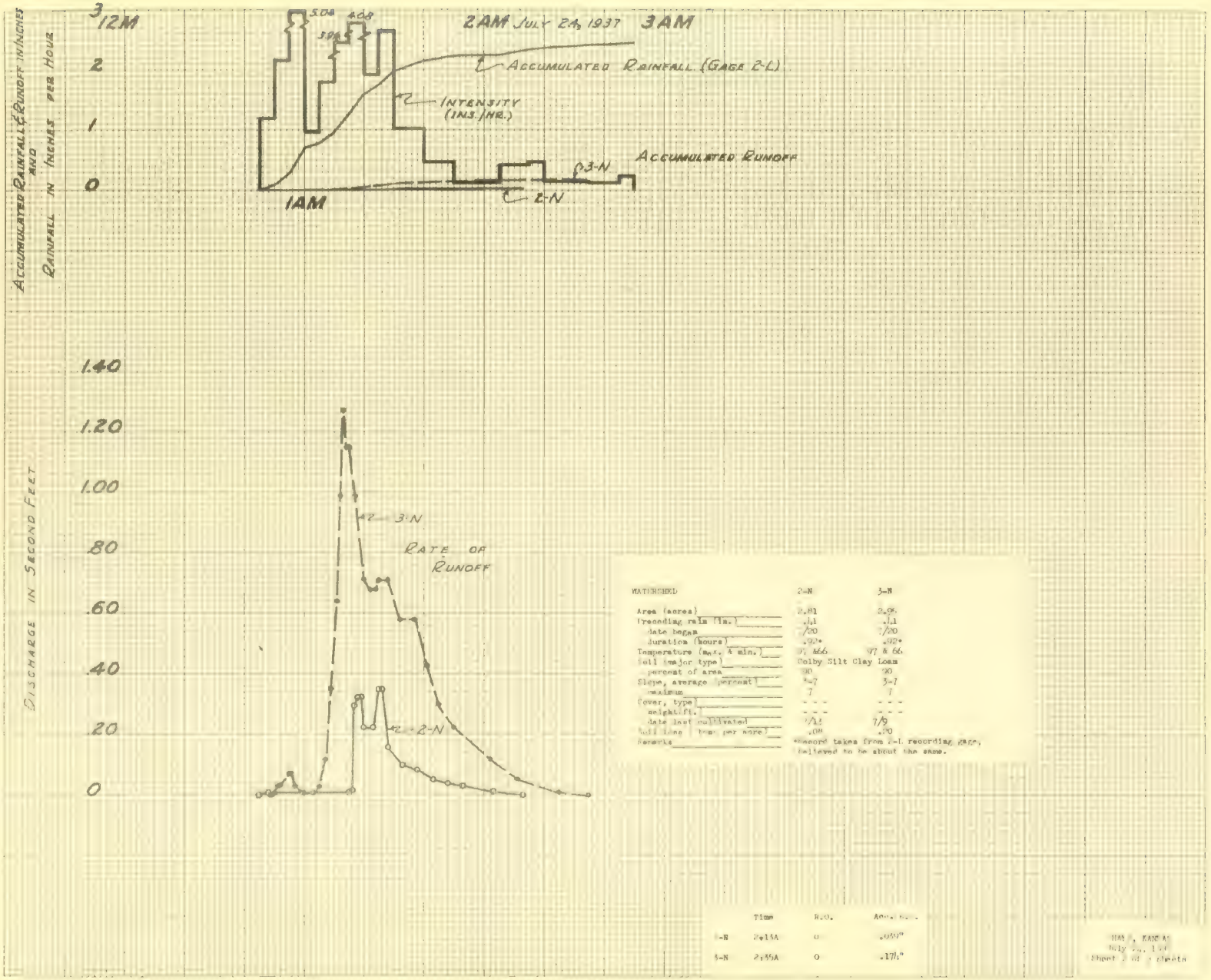
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO.____ JULY, 24, 1937

Plot by S.A.M. date 2-40 checked by R.[illegible] date 2-40
Computations by S.A.M. date 2-40 checked by H.C.K. date 2-40

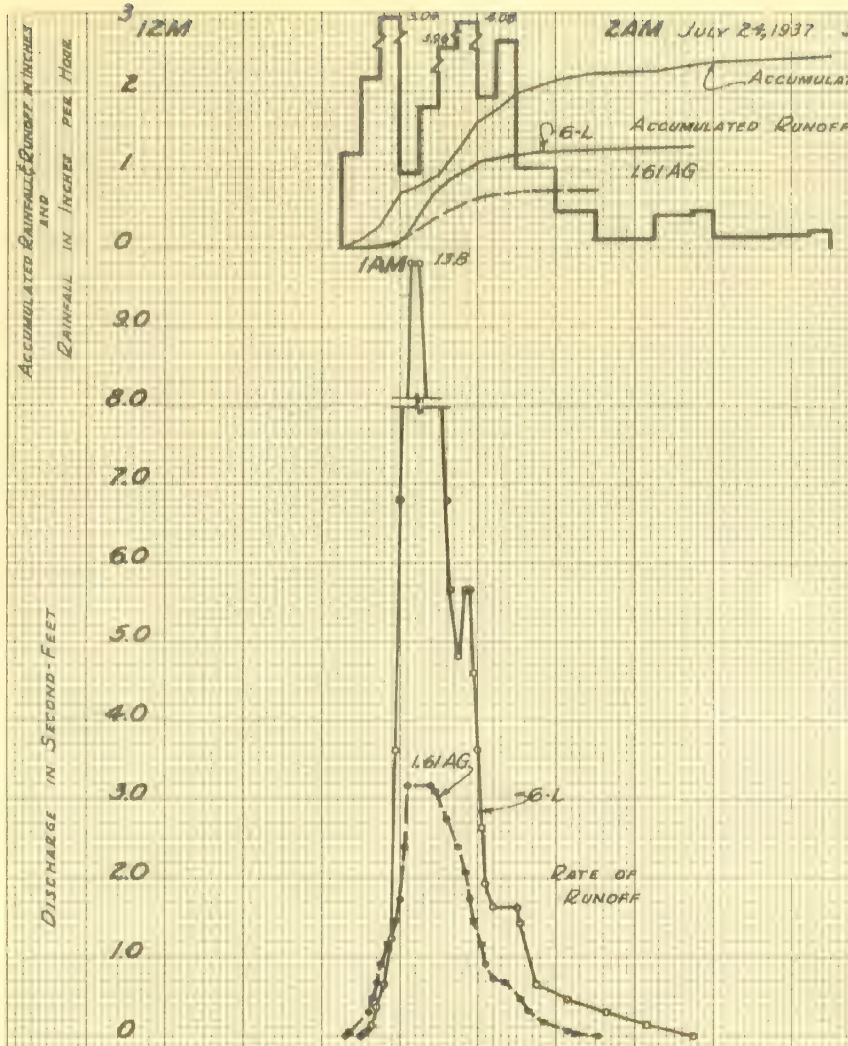
Sheet 1 of 5 Sheets



WATERSHED	2-N	3-N
Area (acres)	2.81	2.98
Preceding rain (in.)	.11	.11
date began	7/20	7/20
duration (hours)	.92+	.92+
Temperature (max. & min.)	97 & 66	97 & 66
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	- - -	- - -
neighift.	- - -	- - -
date last cultivated	7/12	7/9
Soil loss (tons per acre)	.08	.20
Remarks	*Record taken from 2-L recording gage, believed to be about the same.	

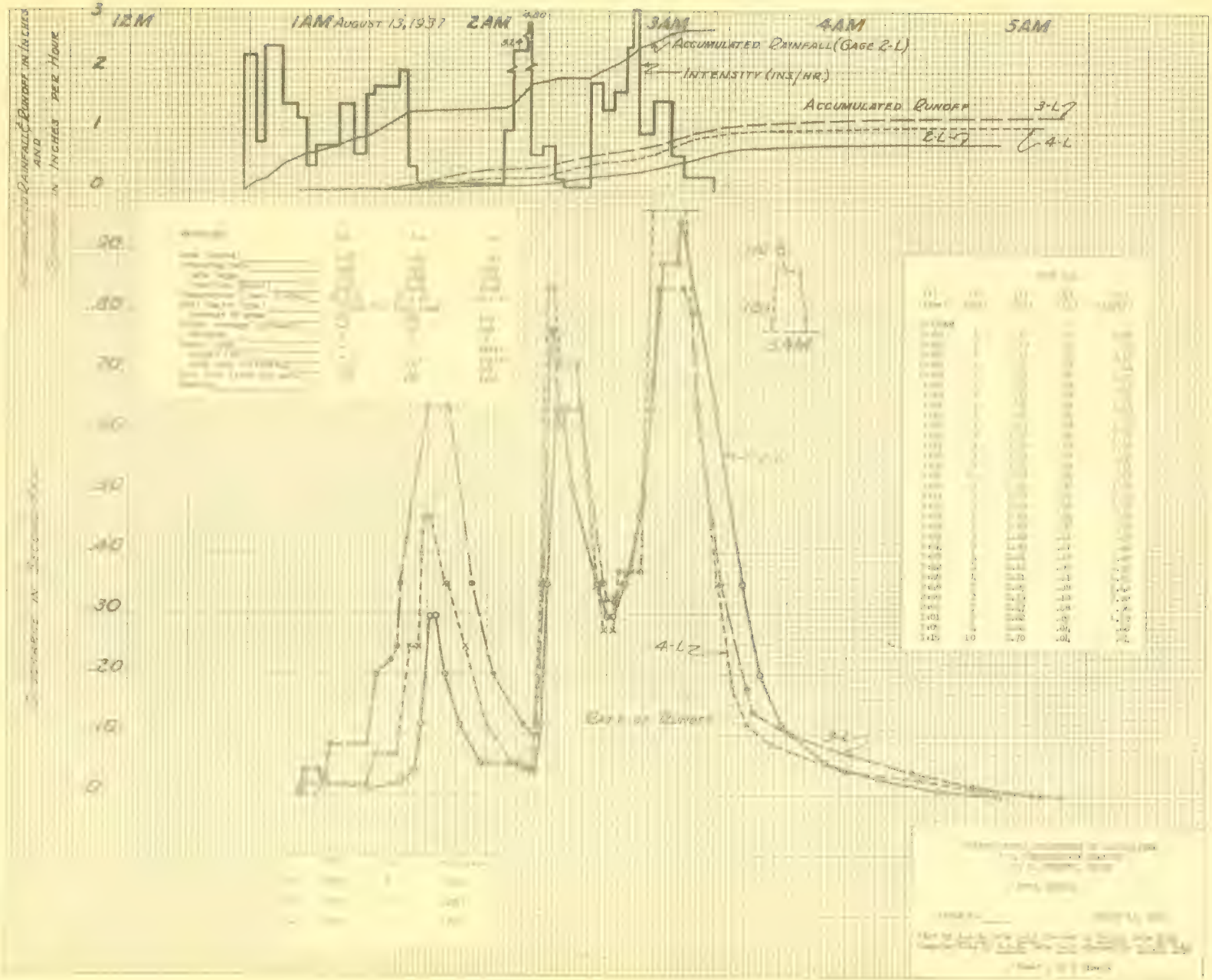
	Time	R.O.	Accu. Run.
2-N	2:15A	0	.059"
3-N	2:35A	0	.171"

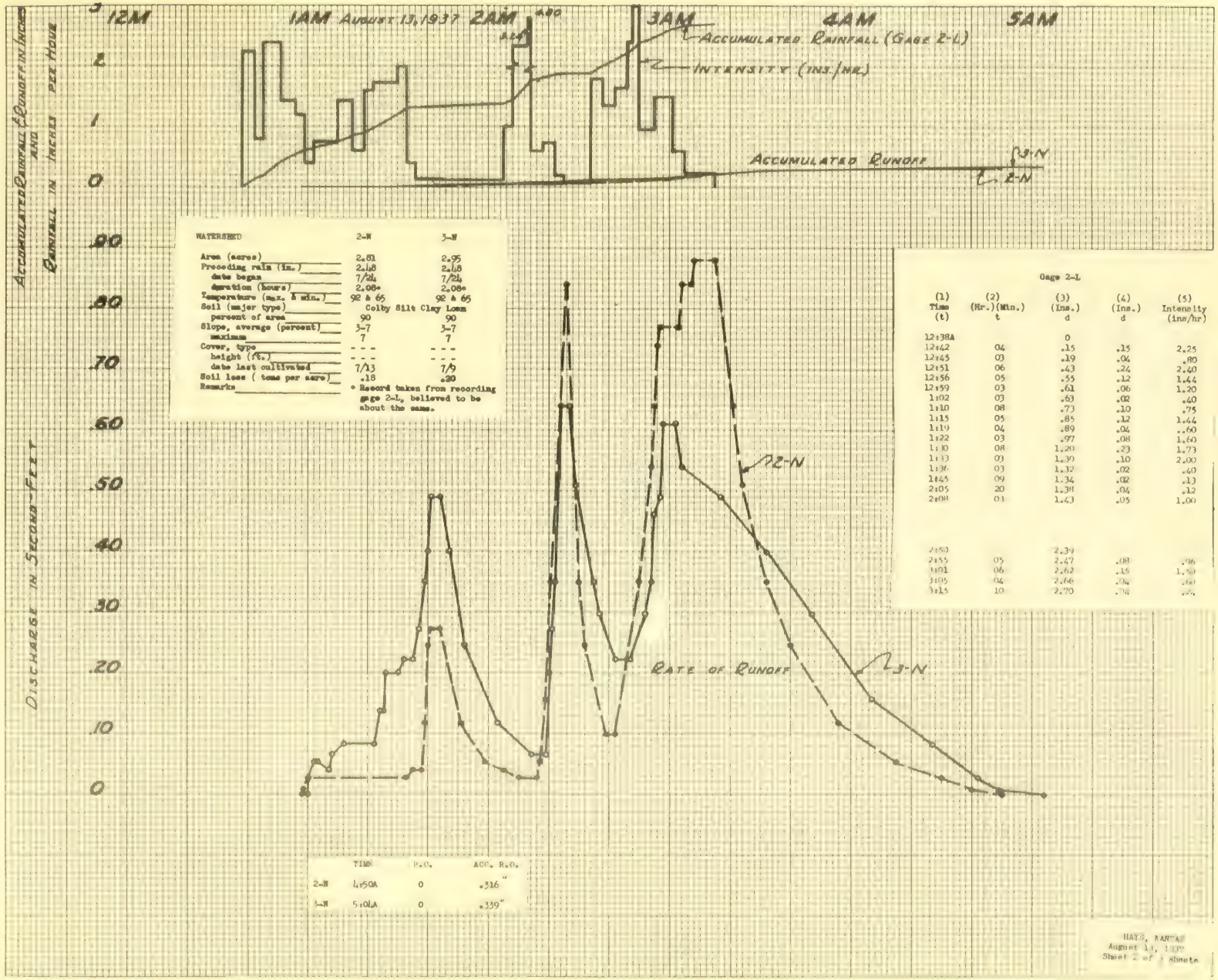
HAYS, KANSAS
July 24, 1937
Sheet 1 of 1 sheets



WATERSHED	6-L	1.61AG
Area (acres)	2.85	1.61
Preceding rain (in.)	.22	.25
date began	1/20	7/20
duration (hours)	.92	.92*
Temperature (max. & min.)	97 & 66	97 & 66
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	85
Slope, average (percent)	4-7	5-8
maximum	7	8
Cover, type	- - -	- - -
height (ft.)	- - -	- - -
date last cultivated	1/7	- - -
Soil loss (tons per acre)	6.11	0
Remarks	*Record taken from recording gage 2-L, believed to be about the same. **Native	

	Time	R.O.	Acc. R.O.
6-L	2:15A	0	1.297"
1.61AG	1:51A	0	.743"


RAINFALL, RUNOFF IN INCHES AND RUNOFF IN INCHES PER HOUR
12M
1AM AUGUST 13, 1937
2AM
3AM
4AM
5AM
ACCUMULATED RAINFALL (GAGE 2-L)
INTENSITY (INS/HR.)
ACCUMULATED RUNOFF
3-L
2-L
4-L
4-L
3-L
2-L
3 AM
4-L
Gage of Runoff



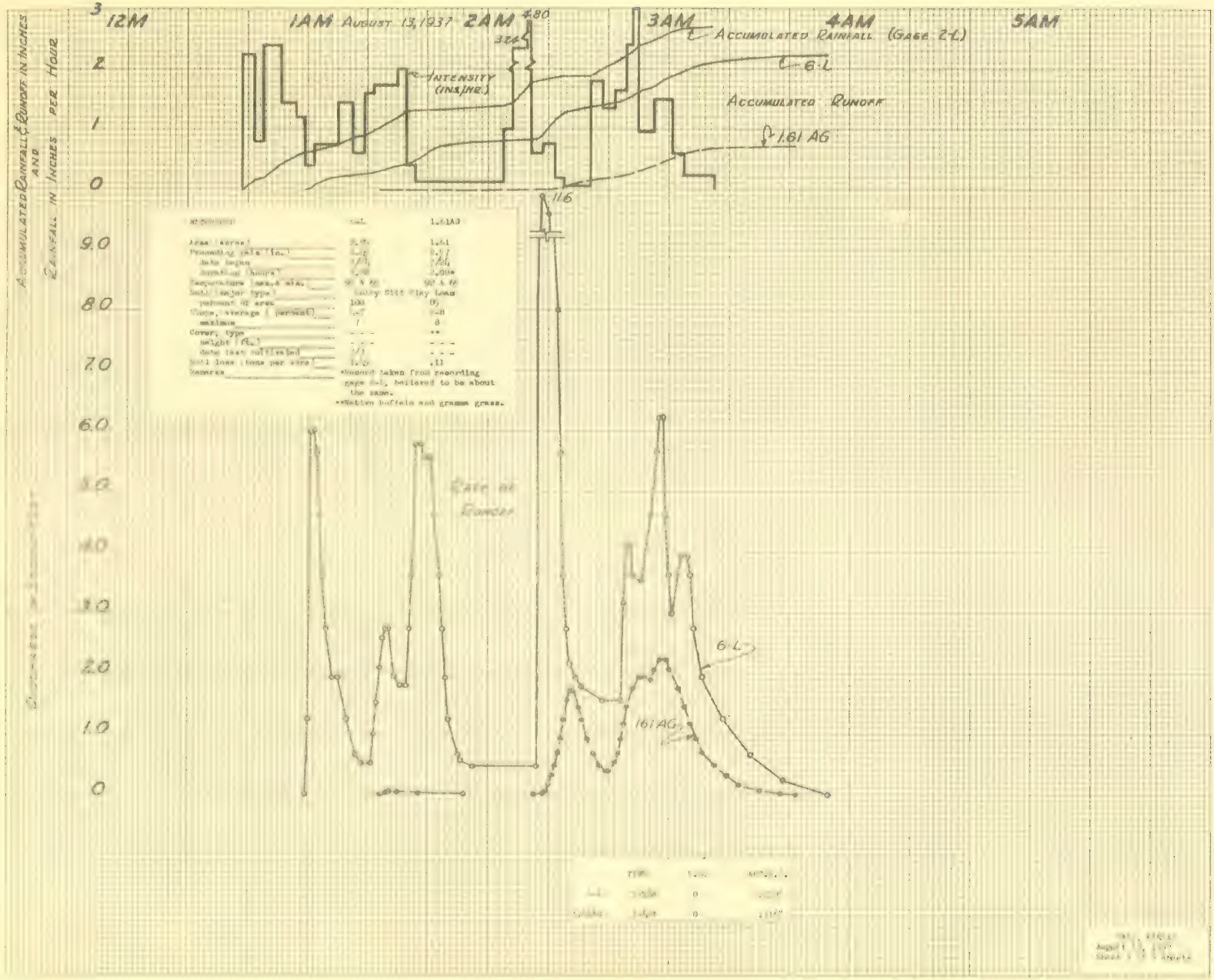
WATERSHED	2-N	3-N
Area (acres)	2.81	2.95
Preceding rain (in.)	2.48	2.48
date began	7/24	7/24
duration (hours)	2.08+	2.08+
Temperature (max. & min.)	92 & 65	92 & 65
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	- - -	- - -
height (ft.)	- - -	- - -
date last cultivated	7/13	7/9
Soil loss (tons per acre)	.18	.20
Remarks	* Record taken from recording gage 2-L, believed to be about the same.	

Gage 2-L

(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) Intensity (ins/hr)
12:38A		0		
12:42	04	.15	.15	2.25
12:45	03	.19	.04	.80
12:51	06	.43	.24	2.40
12:56	05	.55	.12	1.44
12:59	03	.61	.06	1.20
1:02	03	.63	.02	.40
1:10	08	.73	.10	.75
1:15	05	.85	.12	1.44
1:19	04	.89	.04	.60
1:22	03	.97	.08	1.60
1:30	08	1.20	.23	1.73
1:33	03	1.30	.10	2.00
1:36	03	1.32	.02	.40
1:45	09	1.34	.02	.13
2:05	20	1.38	.04	.12
2:08	03	1.43	.05	1.00
2:50		2.39		
2:55	05	2.47	.08	.96
3:01	06	2.62	.15	1.50
3:05	04	2.68	.06	.60
3:15	10	2.70	.02	.12

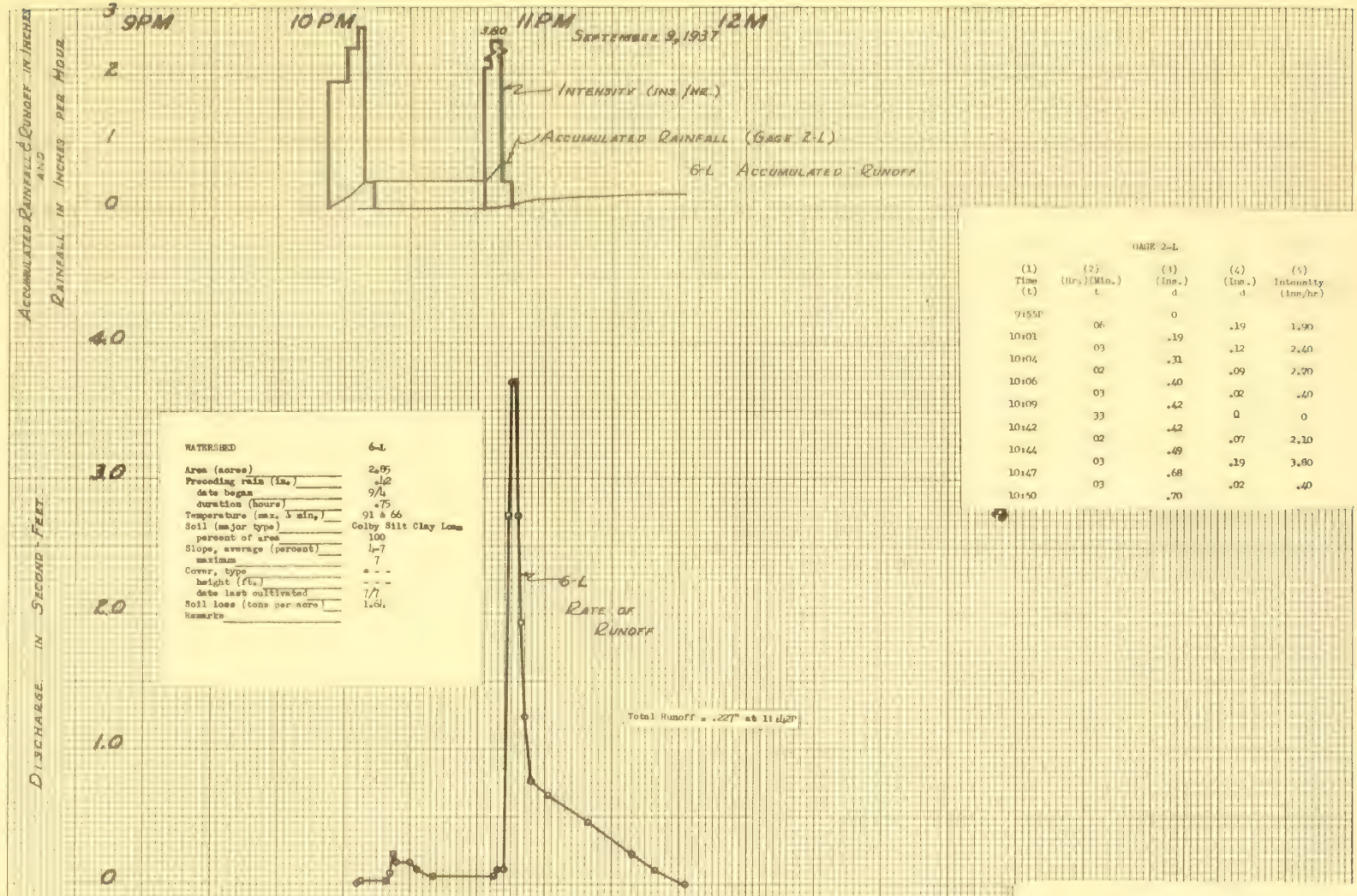
	TIME	R.O.	ACC. R.O.
2-N	4:50A	0	.316"
3-N	5:01A	0	.339"

HAYS, KANSAS
August 14, 1937
Sheet 2 of 3 Sheets



	2-L	1.61AG
Area (acres)	2.47	1.61
Permeability rate (in.)	1.2	0.11
Date began	7/31	7/31
Duration (hours)	1.0	1.0lo
Temperature (max.& min.	92 & 66	92 & 66
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	0
Slope, average (percent)	1.5	0-8
maximum	7	8
Cover, type	- - -	**
height (ft.)	- - -	- - -
date last cultivated	7/1	- - -
Soil loss (tons per acre)	1.0	.11
Remarks		

*Amount taken from recording gage 2-L, believed to be about the same.
**Native buffalo and gramma grass.



WATERSHED	6-L
Area (acres)	2.85
Preceding rain (In.)	.42
date began	9/4
duration (hours)	.75
Temperature (max. & min.)	91 & 66
Soil (major type)	Colby Silt Clay Loam
percent of area	100
Slope, average (percent)	4-7
maximum	7
Cover, type	- - -
height (ft.)	- - -
date last cultivated	7/7
Soil loss (tons per acre)	1.61
Remarks	

GAGE 2-L

(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) Intensity (ins/hr)
9:55P		0		
10:01	06	.19	.19	1.90
10:04	03	.31	.12	2.40
10:06	02	.40	.09	2.70
10:09	03	.42	.02	.40
10:42	33	.42	0	0
10:44	02	.49	.07	2.10
10:47	03	.68	.19	3.80
10:50	03	.70	.02	.40

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO._____ SEPTEMBER 9, 1937

Plot by S.A.W. date 2-10 checked by R.O.H. date 2-10
Computations by S.A.W. date 2-10 checked by H.H.H. date 2-10

Sheet 1 of 1 Sheets

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month January, February, March, 1938

Project HAYS, KANSAS

Sheet 1 of 7 sheets

Date	Watershed		Rainfall							Temperature (degrees F.)		Runoff					Rainfall Minus Runoff (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	Maximum Intensity: 5 minutes (inches per hour)	Maximum Intensity: 15 minutes (inches per hour)	Maximum Intensity: 60 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate: Cu. ft. sec.	Maximum Rate: Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
January 7			U.S. Weather Bureau			T	Standard Gage			35	13								2-L. Terraced Area Colby Silt Clay Loam. Average land slope 5 to 6%. Vertical spacing 4 feet. Grade constant 4 inches. Terrace length 700 feet. Ridgebusted 3/18. Duckfooted 4/14, 4/25 and 6/6. Planted to Atlas Sorgo. 6/8. Harrowed sorgo, 7/8. Weeded sorgo, 7/26. Harvested sorgo, 10/5. Basin listed, 11/29.
19			do	do	do	.06	do	do		50	21								
30			do	do	do	T	do	do		20	1								
February 15			do	do	do	.15	do	do		33	23								
16			do	do	do	.10	do	do		23	13								
17			do	do	do	.40	do	do		16	12								3-L. Terraced Area. Colby Silt Clay Loam Average land slope 5 to 7%. Vertical spacing 4 feet. Grade constant 4 inches. Terrace length 700 feet. Wheat harvested 6/27. Basin listed, 7/12. Ridgebusted, 8/24. One way plowed and packed, 9/21. Basin listed 11/29.
18			do	do	do	T	do	do		20	9								
22			do	do	do	T	do	do		41	13								
25			do	do	do	T	do	dc		60	25								
March 1			do	do	do	.13	do	do		57	29								4-L. Terraced Area. Colby Silt Clay Loam. Average land slope 6 to 8%. Vertical spacing 4 feet. Grade constant 4 inches. Terrace length 700 feet. Ridgebusted and packed, 4/6. Drilled barley, 4/11. Harvested barley, 6/20. Basin listed, 7/12. Ridgebusted, 8/24. One way plowed and packed, 9/21. Seeded to wheat, 9/26.
2			do	do	do	.04	do	do		65	35								
3			do	do	do	T	do	do		57	33								
4			do	do	do	T	do	do		47	38								
8			do	do	do	.01	do	do		61	30								
9			do	do	do	.83	do	do		47	39								

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH March, April, 1938

SHEET 2 OF 7 SHEETS

U. S. GOVERNMENT PRINTING OFFICE : 1938

DATE	WATERSHED		RAINFALL							TEMPERATURE (degrees F.)		RUN-OFF					RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
							MAXIMUM INTENSITY								MAXIMUM RATE				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft./sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
March 14*	3-L	.85	2-L	6:45P	20	.50	3.12	1.76	---	60	43	6:54P	8:02P	.131	.14	7:06P	.37	.19	2-N. Terraced Area.
*	6-L	2.85	2-L	6:45P	20	.46	3.12	1.76	---	60	43	6:57P	8:06P	.174	2.40	7:08P	.29	.48	Colby Silt Clay Loam.
*1.61AG	1.61		U.S. Weather Bureau			.46	Standard Gage			60	43	6:58P	7:47P	.055	.26	7:13P	.40	.02	Average land slope 3 to 7%.
																			Vertical spacing 2 feet.
																			Grade constant level.
22			U.S. Weather Bureau			T	Standard Gage			75	41								Terrace length 1600 feet.
																			Harvested wheat 6/29.
																			Basin listed, 7/11.
28			2-L	12:15A	380	.37	.48	.32	.28	58	41								Ridgebusted, 8/23.
																			One way plowed and packed, 9/22.
																			Seeded to wheat, 9/29.
April 5(a)			2-L		240	.05	---	---	---	60	39								
																			3-N. Terraced Area.
6			U.S. Weather Bureau			T	Standard Gage			45	31								Colby Silt Clay Loam.
																			Average land slope 3 to 7%.
																			Vertical spacing 3 feet.
7			U.S. Weather Bureau			.35	Standard Gage			31	24								Grade constant level.
																			Terrace length 1600 feet.
																			Harvested wheat, 6/29.
8			U.S. Weather Bureau			.05	Standard Gage			40	23								Basin listed, 7/12.
																			Ridgebusted, 8/23
																			One way plowed and packed, 9/22.
14			2-L	6:40P	115	.22	.48	.40	.24	76	57								Seeded to wheat, 9/28.
15*	6-L	2.85	2-L	6:37A	18	.24	2.40	.94	---	64	52	6:39A	7:44A	.060	.89	6:47A	.18	.04	6-L. Cultivated Area.
*	1.61AG	1.61	U.S. Weather Bureau			.32	Standard Gage			64	52	6:53A	7:29A	.023	.18	6:58A	.30	.01	Colby Silt Clay Loam.
																			Average land slope 4 to 7 %.
																			Harvested wheat, 6/28.
15(a)			2-L	9:30A	15	.02	---	---	---	64	52								One way plowed around field 7/16.
																			One way plowed and packed, 8/24, and 9/21.
15(a)			2-L	4:45P	20	.04	---	---	---	64	52								Seeded to wheat, 9/26.
15-16(a)			2-L			.26	---	---	---	66	47								1.61 AG. Pasture Area.
																			Colby Silt Clay Loam.
																			Average land slope 5 to 8%.
20(a)			2-L		10	.02	---	---	---	67	38								Cover of native buffalo and gramma grass.
																			Grazing began 5/20.
																			ended, 8/10.
																			Not over grazed.

* Hydrographs plotted for these storms.
(a) Estimated.--Gage stuck or clock trouble.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

PROJECT HAYS, KANSAS

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

MONTH April, May, 1938

SHEET 3 OF 7 SHEETS

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. Secs.	Time			
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19
April 2(a)			2-L		5	.03	---	---	---	59	41								
23			U.S. Weather Bureau			T	Standard Gage			76	48								
25			U.S. Weather Bureau			.02	Standard Gage			77	60								
26-27			2-L	8:40P	320	1.09	.96	.80	.60	74	50								
27(a)			2-L		10	.03	---	---	---	67	50								
May 1			U.S. Weather Bureau			T	Standard Gage			61	63								
2(a)			2-L		10	.10	---	---	---	62	50								
3			2-L	5:30	230	.50	1.20	.80	.44	76	56								
4			2-L	4:19A	406	.31	.36	.20	.12	68	47								
5			U.S. Weather Bureau			T	Standard Gage			62	41								
6			2-L	8:34A	50M	.26	.60	.32	.16	59	44								
7(a)			2-L		286	.46	---	---	---	50	37								
12			U.S. Weather Bureau			T	Standard Gage			73	49								
13			U.S. Weather Bureau			.01	Standard Gage			74	46								
14			U.S. Weather Bureau			T	Standard Gage			71	47								

(a) Estimated. --- Clock Trouble.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

PROJECT HAYS, KANSAS

MONTH May, June, 1938

SHEET 4 OF 7 SHEETS

U. S. GOVERNMENT PRINTING OFFICE 5 12368

DATE	WATERSHED		RAINFALL				MAXIMUM INTENSITY			TEMPERATURE (degrees F.)		RUN-OFF			MAXIMUM RATE		RAINFALL MINUS RUN-OFF (inches)	SILT LOSS (tons per acre)	CONDITION OF WATERSHED
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
May 16(a)			2-L		95	.29	---	---	---	82	54								
16 *	2-L	1.03	2-L	6:35P	230	2.09	2.88	2.24	1.22	82	54	6:45P	10:45P	1.285	1.39	8:25P	.80	2.54	
	3-L	.85	2-L	6:35P	230	2.09	2.88	2.24	1.22	82	54	6:36P	10:04P	1.060	.64	8:21P	1.03	.35	
	4-L	.87	2-L	6:35P	230	2.09	2.88	2.24	1.22	82	54	6:41P	10:06P	1.214	.68	8:22P	.88	.59	
	2-N	2.85	3-N	6:35P	230	2.09	2.88	2.24	1.22	82	54	6:43P	9:56P	.125	.30	8:22P	1.98	.02	
	3-N	2.81	3-N	6:35P	230	2.09	2.88	2.24	1.22	82	54	6:42P	10:23P	.155	.30	8:23P	1.94	.03	
	6-L	2.95	2-L	6:35P	230	2.09	2.88	2.24	1.22	82	54	6:38P	9:53P	1.248	5.23	6:50P	.84	.40	
	1.61AG	1.61	U.S. Weather Bureau			2.28	Standard Gage			82	54	6:38P	9:50	.852	2.06	6:49P	1.33	.09	
18			U.S. Weather Bureau			T	Standard Gage			76	55								
21			2-L	3:10P	40	.09	.60	.24	.12	61	52								
22			2-L	4:40P	280	.42	.36	.32	.20	59	46								
23			2-L	3:23A	415	.58	.72	.52	.34	69	48								
26			2-L	8:30P	70	.08	.24	.12	.06	81	52								
30 *	2-L	1.03	2-L	6:45A	291	1.61	3.56	3.07	2.16	73	56	6:55A	12:22P	1.123	3.24	7:05A	.49	(b)	
	3-L	.85	2-L	6:45A	291	1.61	3.56	3.07	2.16	73	56	6:53A	8:27A	.574	.71	7:07A	.90	.19	
	4-L	.87	2-L	6:45A	291	1.61	3.56	3.07	2.16	73	56	6:54A	12:21P	.800	.84	7:11A	.77	.33	
	2-N	2.85	3-N	6:45A	291	1.67	3.56	3.07	2.16	83	56	6:53A	8:05A	.065	.37	7:02A	1.61	.01	
	3-N	2.81	3-N	6:45A	291	1.67	3.56	3.07	2.16	73	56	6:57A	8:15A	.076	.49	7:12A	1.59	.02	
	6-L	2.95	2-L	6:45A	291	1.61	3.56	3.07	2.16	73	56	6:54A	12:18P	.702	7.27	7:07A	.91	.31	
	1.61AG	1.61	U.S. Weather Bureau			1.86	Standard Gage			73	56	6:57A	8:15A	.582	2.75	7:08A	1.28	.07	
30-31*	3-L	1.03	2-L	7:00P	450	.90	.84	.48	.31	77	56	7:17P	2:22A	.556	.230	7:27P	.34	3.63	
June 3			U.S. Weather			T	Standard Gage			81	60								

* Hydrographs plotted for these storms.

(a) Estimate --clock trouble.

(b) Soil loss included in storm of May 30-31.

Form S. C. S.-445

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

Project HAYS, KANSAS

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Month June, July, 1938

Sta. 2 of 7 Fld.

Date	Watershed		Rainfall				Maximum Intensity			Temperature (in degrees F.)		Runoff					Rainfall Minus Runoff (inches)	Soil Loss (tons per acre)	Remarks on Soil Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	7 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Peaked (hour)	Amount (inches)	Maximum Rate (cu. ft. per sec.)	Time			
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	19
June 8			U.S. Weather Bureau			T	Standard Gage			75	48								
10			2-L	7:10P	250	.55	.72	.56	.40	89	60								
13			2-L	9:15P	125	.43	1.20	.88	.56	93	68								
14			2-L	3:50P	105	.42	.96	.72	.60	85	62								
17			2-L	1:02P	118	.47	1.56	1.04	.66	80	60								
20			2-L	1:13A	122	.26	.36	.20	.16	90	64								
24			U.S. Weather Bureau			.01	Standard Gage			96	66								
24-25			2-L	10:30P	250	.23	.24	.12	.08	96	66								
July 6 (a)			2-L		50	.02	---	---	---	100	67								
7			2-L	4:05A	50	.06	.12	.08	.06	91	62								
17(a)			2-L		15	.02	---	---	---	85	65								
19			2-L	6:00P	50	.14	1.08	.80	.62	98	60								
22			2-L	1:44P	10	.07	.24	---	---	94	60								
27			2-L	12:05A	40	.28	.24	.12	.10	97	70								

(a) Estimate Gage stuck

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

Month July, August, September, 19 38

Project HAYS, KANSAS

RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Sheet 6 of 7 sheets

Date	Watershed		Rainfall							Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
							Maximum Intensity								Maximum Rate				
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Cu. ft./sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
July 28(a)			2-L		30	.02	---	---	---	91	69								
August 8			2-L	4:25A	10	.05	---	---	---	102	72								
14*	2-L	1.03	2-L	3:55A	320	2.00	4.20	3.28	2.07	103	67	4:22A	7:10A	.200	.30	4:33A	1.80	.21	
*	1.61AG	1.61	U.S. Weather Bureau			1.72	Standard Gage			103	67	4:23A	5:12A	.155	.65	4:34	1.57	.01	
15			2-L	11:35A	25	.19	1.20	.64	---	81	68								
16			U.S. Weather Bureau			.01				84	63								
28-29			2-L	10:25P	245	.11	.24	.12	.08	97	63								
Sept. 1			U.S. Weather Bureau			T	Standard Gage			88	71								
2			2-L	4:00P	50	.08	.24	.16	.12	78	65								
2			2-L	8:00P	75	.06	.12	.08	.06	78	65								
3			2-L	2:15A	45	.07	.12	.08	.06	72	60								
4(a)			2-L		90	.14	---	---	---	76	65								
5			2-L	4:45A	120	.24	.36	.24	.20	78	65								
12*	2-L		2-L	5:38	292	1.40	3.00	2.90	1.92	90	63	5:47P	10:06P	.068	.100	5:59P	1.34	.10	
*	6-L		2-L	5:38P	292	1.40	3.00	2.90	1.92	90	63	5:45P	10:13P	.157	1.72	5:54P	1.25	.09	
*	1.61AG		U.S. Weather Bureau		292	1.39	Standard Gage			90	63	5:50P	10:12P	.093	.43	5:59P	1.30	0	

* Hydrographs plotted for these storms.

Form S. C. S.-345

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DIVISION OF RESEARCH

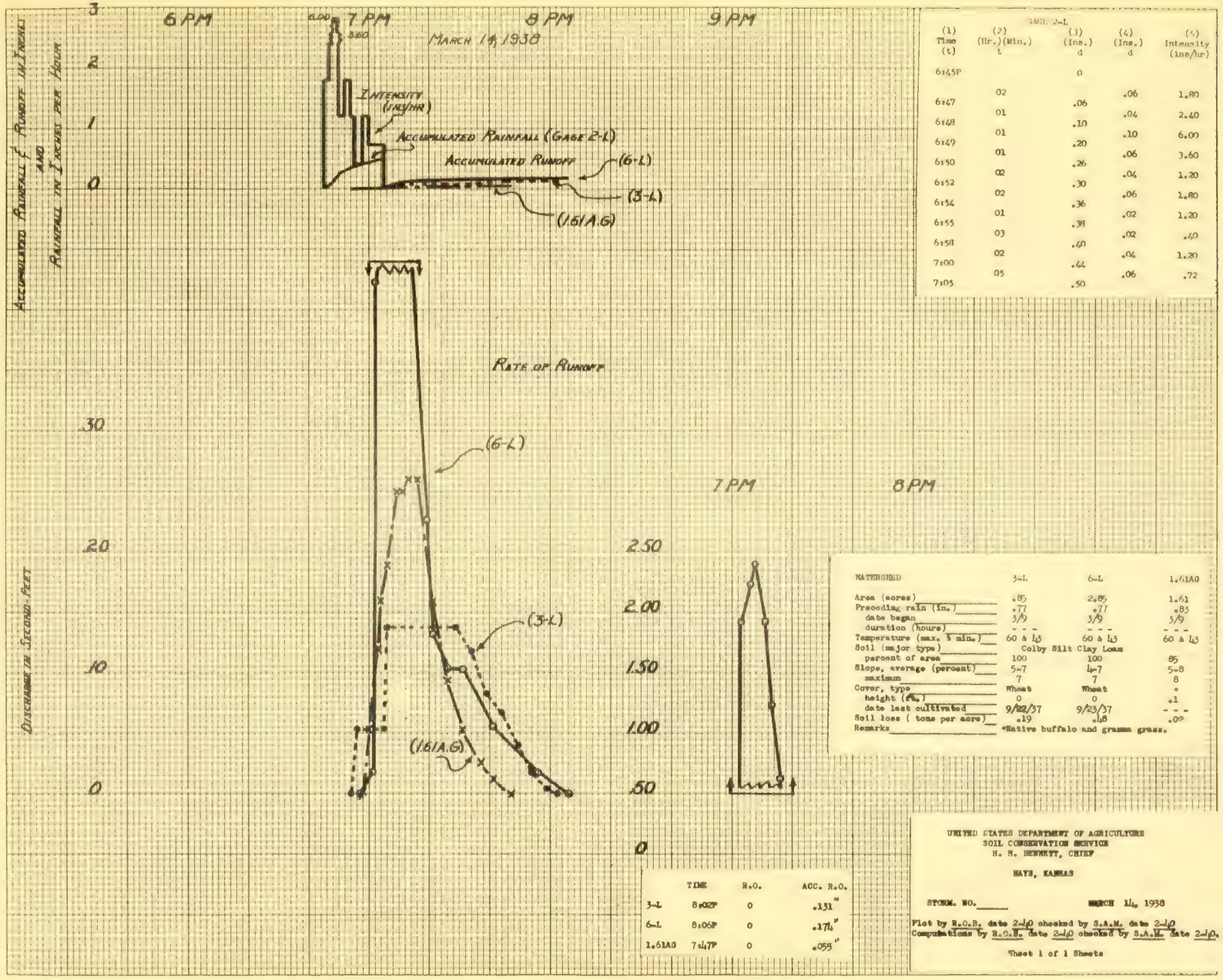
RECORD OF SINGLE STORMS AND THEIR RUN-OFFS ON VARIOUS WATERSHEDS

Project HAYS, KANSAS

Month October, November, December, 1938

Date	Watershed		Rainfall							Temperature (degrees F.)		Run-off					Rainfall Minus Run-off (inches)	Silt Loss (tons per acre)	Condition of Watershed
	Number	Area (acres)	Gage No.	Began (hour)	Duration (minutes)	Amount (inches)	Maximum Intensity: 5 minutes (inches per hour)	15 minutes (inches per hour)	30 minutes (inches per hour)	Maximum	Minimum	Began (hour)	Ended (hour)	Amount (inches)	Maximum Rate: Cu ft. sec.	Time			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)		(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
October 9			U.S. Weather Bureau			.03	Standard Gage			83	59								
Nov. 1			U.S. Weather Bureau			.01	Standard Gage			78	58								
3(a)			2-L	7;40A	120	.12	---	---	---	70	36								
3-4			2-L	8;57P	225	.11	.24	.12	.08	70	26								
6			U.S. Weather Bureau			.05	Standard Gage			36	24								
12			U.S. Weather Bureau			T	Standard Gage			57	36								
Dec. 16			U.S. Weather Bureau			T	Standard Gage			48	28								

(a) Gage Stuck.



GAGE 2-L

(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) Intensity (ins/hr)
6:45P		0		
6:47	02	.06	.06	1.80
6:48	01	.10	.04	2.40
6:49	01	.20	.10	6.00
6:50	01	.26	.06	3.60
6:52	02	.30	.04	1.20
6:54	02	.36	.06	1.80
6:55	01	.38	.02	1.20
6:58	03	.40	.02	.40
7:00	02	.44	.04	1.20
7:05	05	.50	.06	.72

WATERSHED	3-L	6-L	1.61AG
Area (acres)	.85	2.85	1.61
Preceding rain (in.)	.77	.77	.85
date began	3/9	3/9	3/9
duration (hours)	- - -	- - -	- - -
Temperature (max. & min.)	60 & 43	60 & 43	60 & 43
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	85
Slope, average (percent)	5-7	4-7	5-8
maximum	7	7	8
Cover, type	Wheat	Wheat	*
height (ft.)	0	0	.1
date last cultivated	9/22/37	9/23/37	- - -
Soil loss (tons per acre)	.19	.48	.09
Remarks	*Native buffalo and grama grass.		

	TIME	R.O.	ACC. R.O.
3-L	8:02P	0	.131"
6-L	8:06P	0	.174"
1.61AG	7:47P	0	.059"

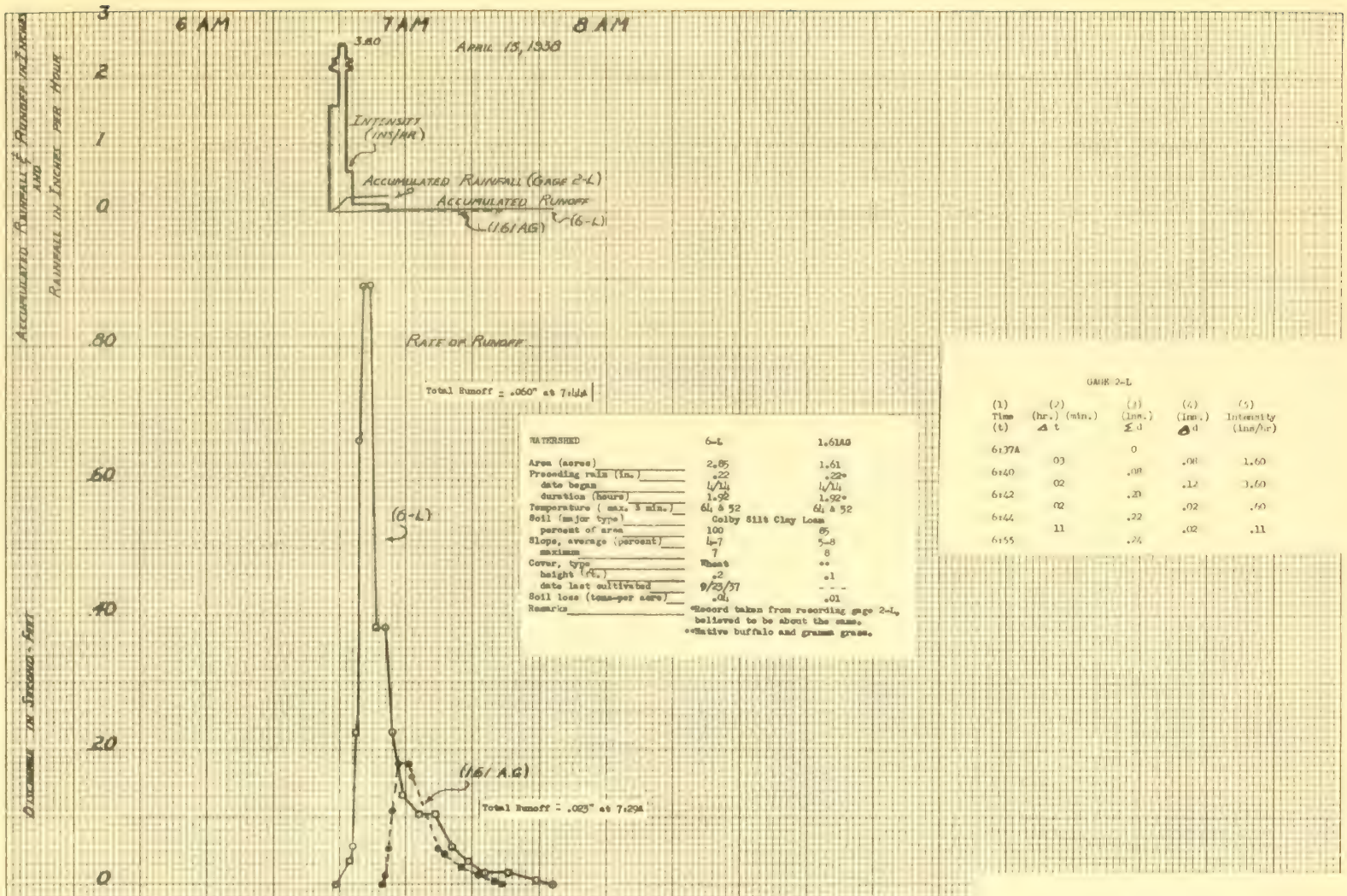
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM. NO.____ MARCH 14, 1938

Plot by R.O.B. date 2-10 checked by S.A.M. date 2-10
Computations by R.O.B. date 2-10 checked by S.A.M. date 2-10.

Sheet 1 of 1 Sheets



WATERSHED	6-L	1.61AG
Area (acres)	2.85	1.61
Preceding rain (in.)	.22	.22*
date began	4/14	4/14
duration (hours)	1.92	1.92*
Temperature (max. 3 min.)	64 & 52	64 & 52
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	85
Slope, average (percent)	4-7	5-8
maximum	7	8
Cover, type	Wheat	**
height (ft.)	.2	.1
date last cultivated	9/23/37	- - -
Soil loss (tons per acre)	.04	.01
Remarks		

*Record taken from recording gage 2-L, believed to be about the same.
**Native buffalo and grama grass.

GAGE 2-L

(1) Time (t)	(2) Δ t (hr.)	(min.)	(3) (ins.) Σ d	(4) (ins.) Δ d	(5) Intensity (ins/hr)
6:37A			0		
6:40		03	.08	.08	1.60
6:42		02	.20	.12	3.60
6:44		02	.22	.02	.60
6:55		11	.24	.02	.11

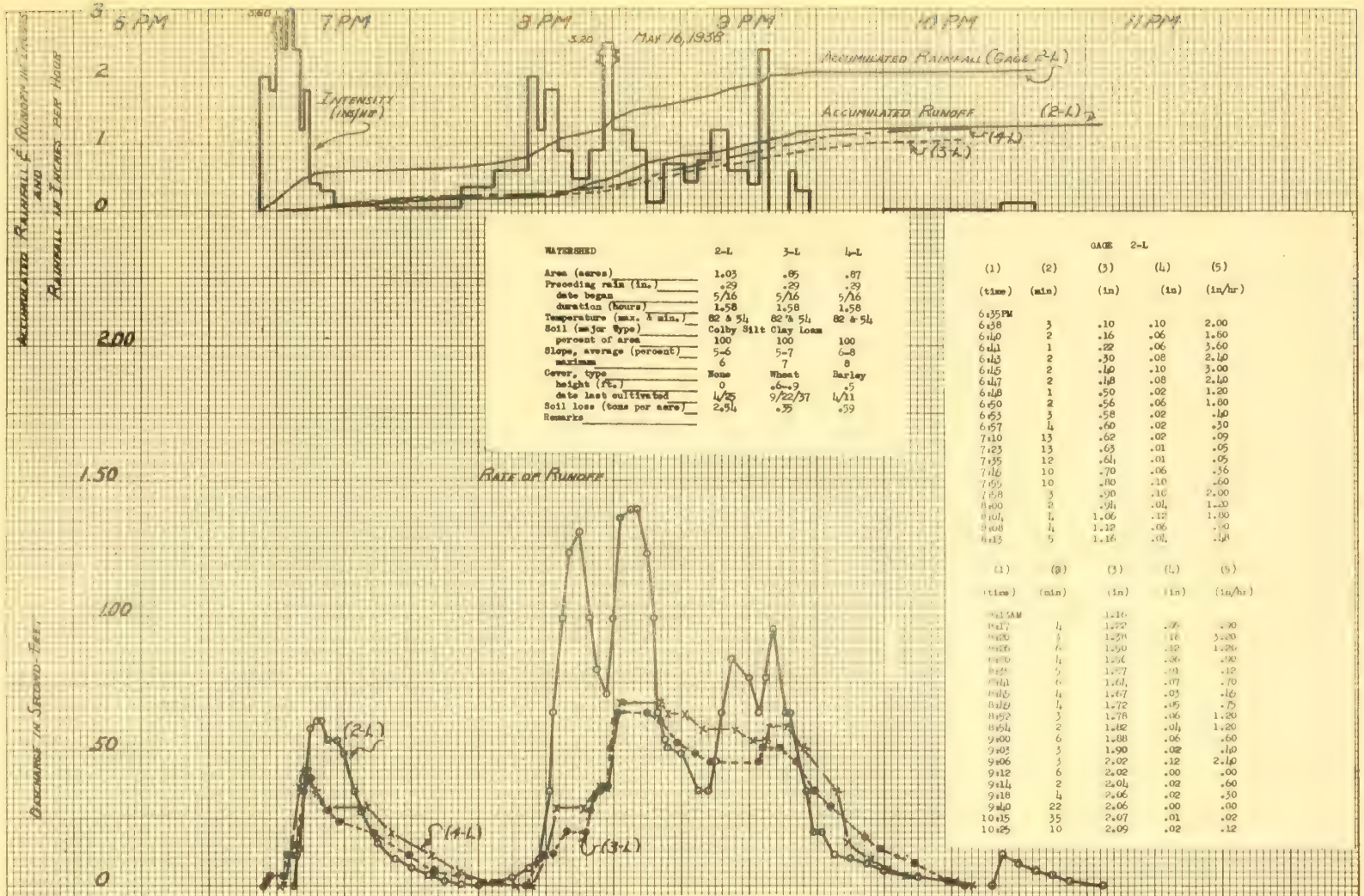
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO.____ APRIL 15, 1938

Plot by R.O.B. date 2-40 checked by S.A.M. date 2-40
Computations by R.O.B. date 2-40 checked by S.A.M. date 2-40

Sheet 1 of 1 sheets



WATERSHED	2-L	3-L	4-L
Area (acres)	1.03	.85	.87
Preceding rain (in.)	.29	.29	.29
date began	5/16	5/16	5/16
duration (hours)	1.58	1.58	1.58
Temperature (max. & min.)	82 & 54	82 & 54	82 & 54
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	100
Slope, average (percent)	5-6	5-7	6-8
maximum	6	7	8
Cover, type	None	Wheat	Barley
height (ft.)	0	.6-.9	.5
date last cultivated	4/25	9/22/37	4/11
Soil loss (tons per acre)	2.54	.35	.39
Remarks			

GAGE 2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
6:35 PM		.10	.10	2.00
6:38	3	.16	.06	1.60
6:40	2	.22	.06	3.60
6:41	1	.30	.08	2.40
6:43	2	.40	.10	3.00
6:45	2	.48	.08	2.40
6:47	2	.50	.02	1.20
6:48	1	.56	.06	1.80
6:50	2	.58	.02	.40
6:53	3	.60	.02	.30
6:57	4	.62	.02	.09
7:10	13	.63	.01	.05
7:23	13	.64	.01	.05
7:35	12	.70	.06	.36
7:46	10	.80	.10	.60
7:56	10	.90	.10	2.00
7:58	2	.94	.04	1.20
8:00	2	1.06	.12	1.80
8:04	4	1.12	.06	.90
8:08	4	1.16	.04	.60
8:13	5			

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
8:15 AM		1.16		
8:17	4	1.22	.06	.90
8:20	3	1.30	.08	1.60
8:26	6	1.40	.10	1.00
8:30	4	1.44	.04	.60
8:35	5	1.47	.03	.36
8:41	6	1.54	.07	.70
8:46	4	1.57	.03	.45
8:49	4	1.72	.05	.75
8:52	3	1.78	.06	1.20
8:54	2	1.82	.04	1.20
9:00	6	1.88	.06	.60
9:03	3	1.90	.02	.40
9:06	3	2.02	.12	2.40
9:12	6	2.02	.00	.00
9:14	2	2.04	.02	.60
9:18	4	2.06	.02	.30
9:40	22	2.06	.00	.00
10:15	35	2.07	.01	.02
10:25	10	2.09	.02	.12

	TIME	R.O.	ACC. R.O.
2-L	10:15P	0	1.265"
3-L	10:04P	0	1.060"
4-L	10:06P	0	1.214"
2-M	9:56P	0	.125"
3-M	10:23P	0	.155"
6-L	9:53P	0	1.24"
1.61AG	9:50P	0	.852"

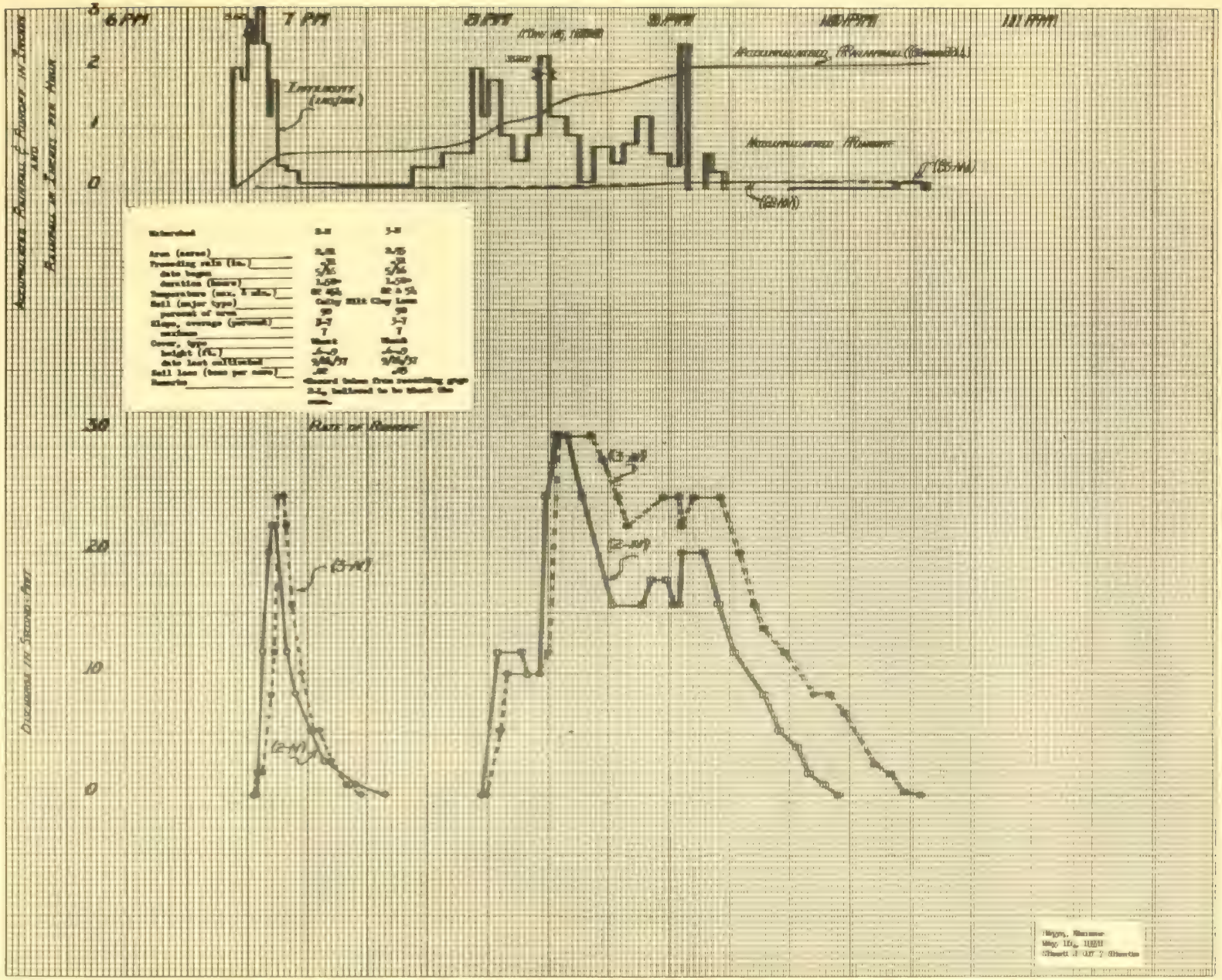
UNITED STATES DEPARTMENT OF AGRICULTURE
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H. H. BENNETT, CHIEF

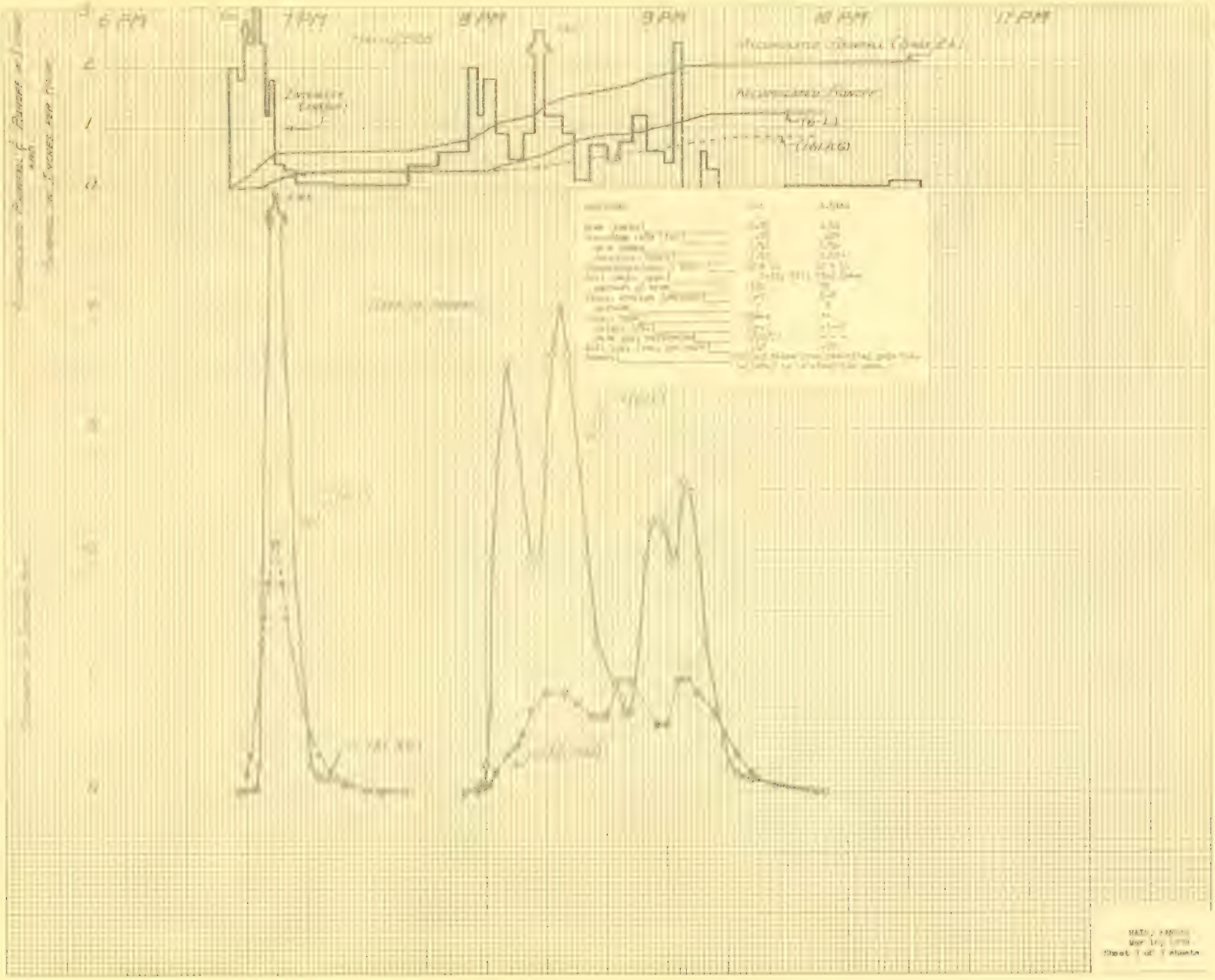
HAYS, KANSAS

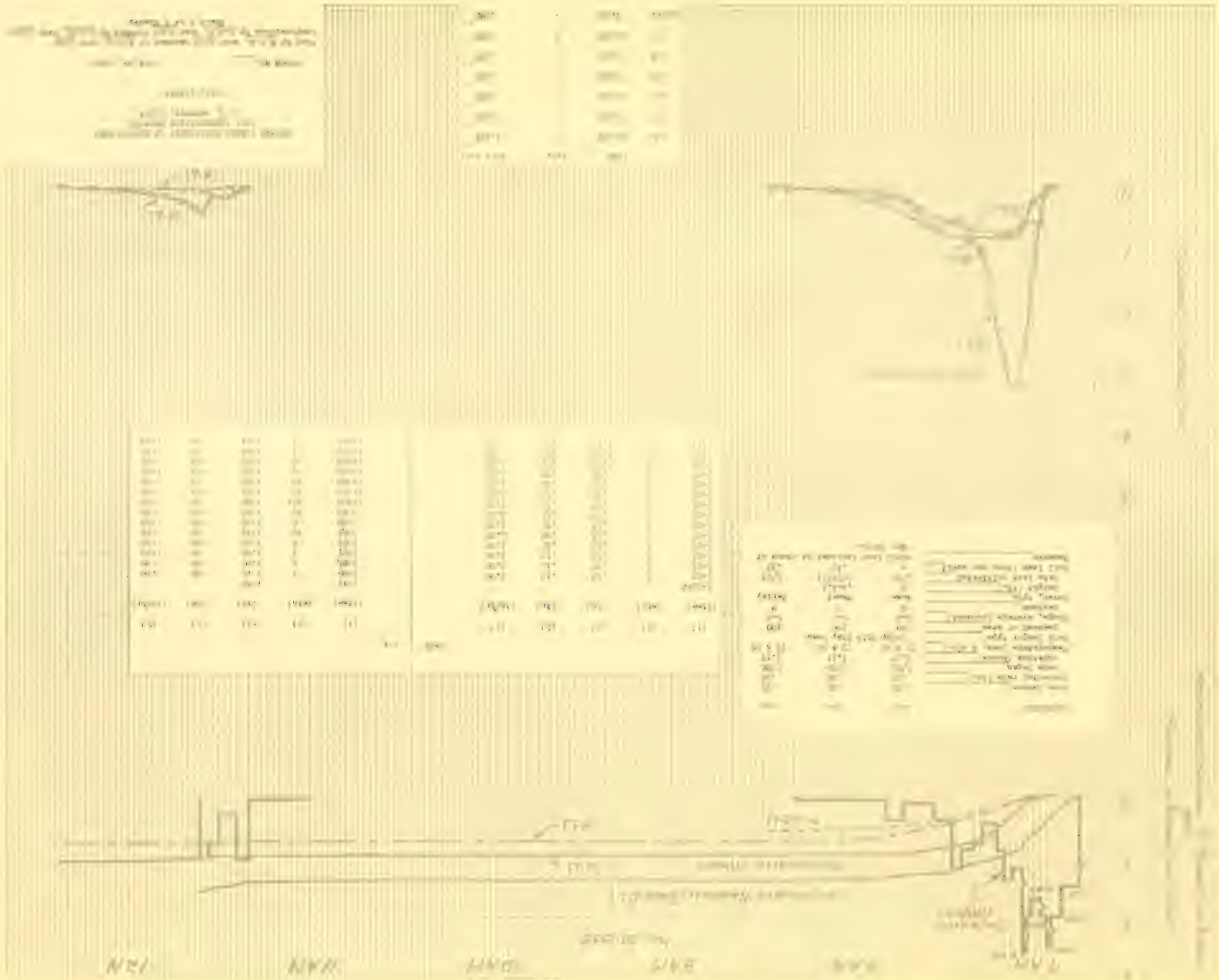
STORM NO.____ MAY 16, 1938

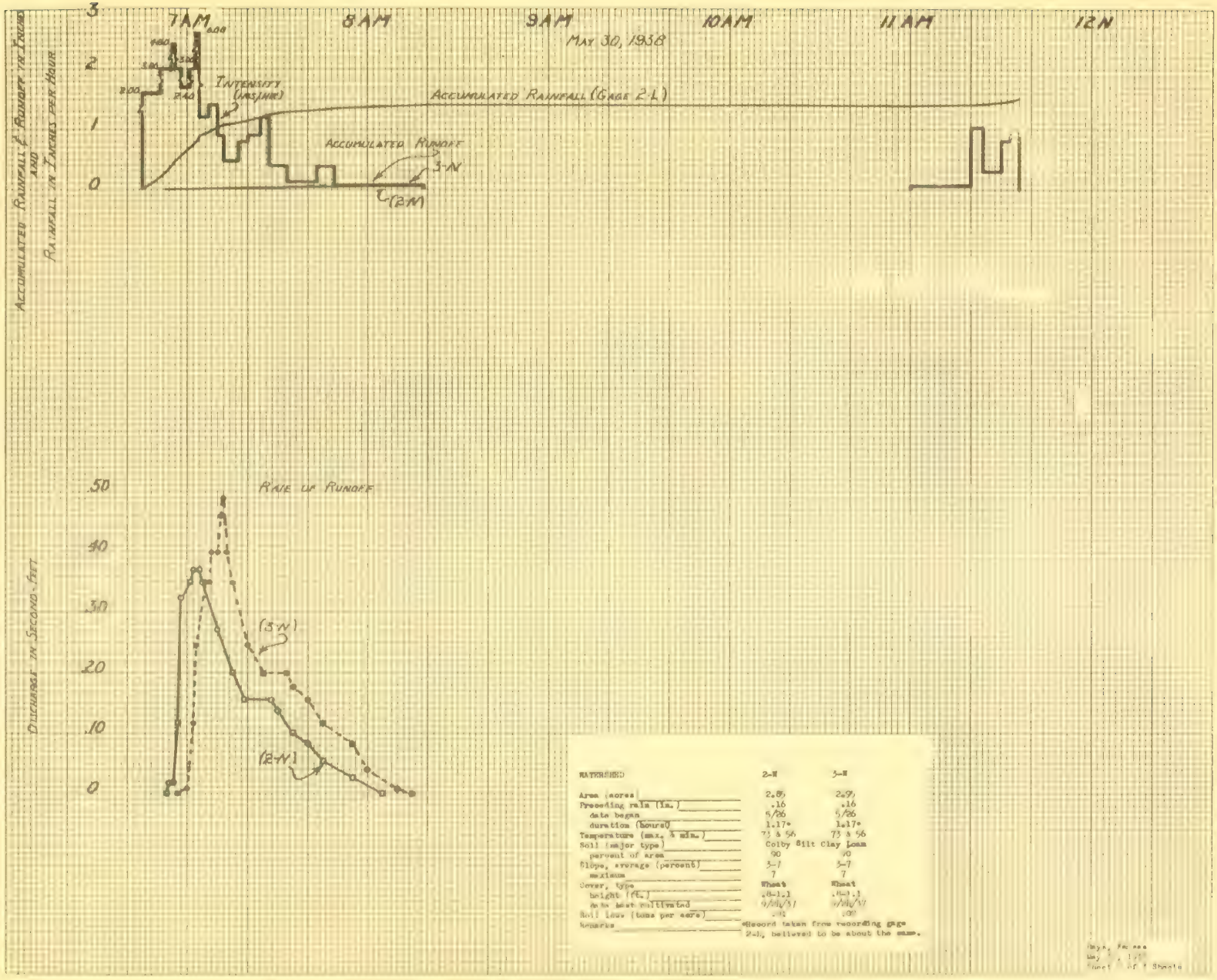
Plot by R.O.B. date 2-40 checked by S.A.M. date 2-40
Computations by R.O.B. date 2-40 checked by S.A.M. date 2/40

Sheet 1 of 3 Sheets


6 PM
7 PM
8 PM
9 PM
10 PM
11 PM
Accumulated Rainfall & Runoff in Inches
AND
Rainfall in Inches per Hour
3
2
1
0
Accumulated Rainfall
Accumulated Runoff
Rate in Inches
30
20
10
0
Discharge in Second-Feet

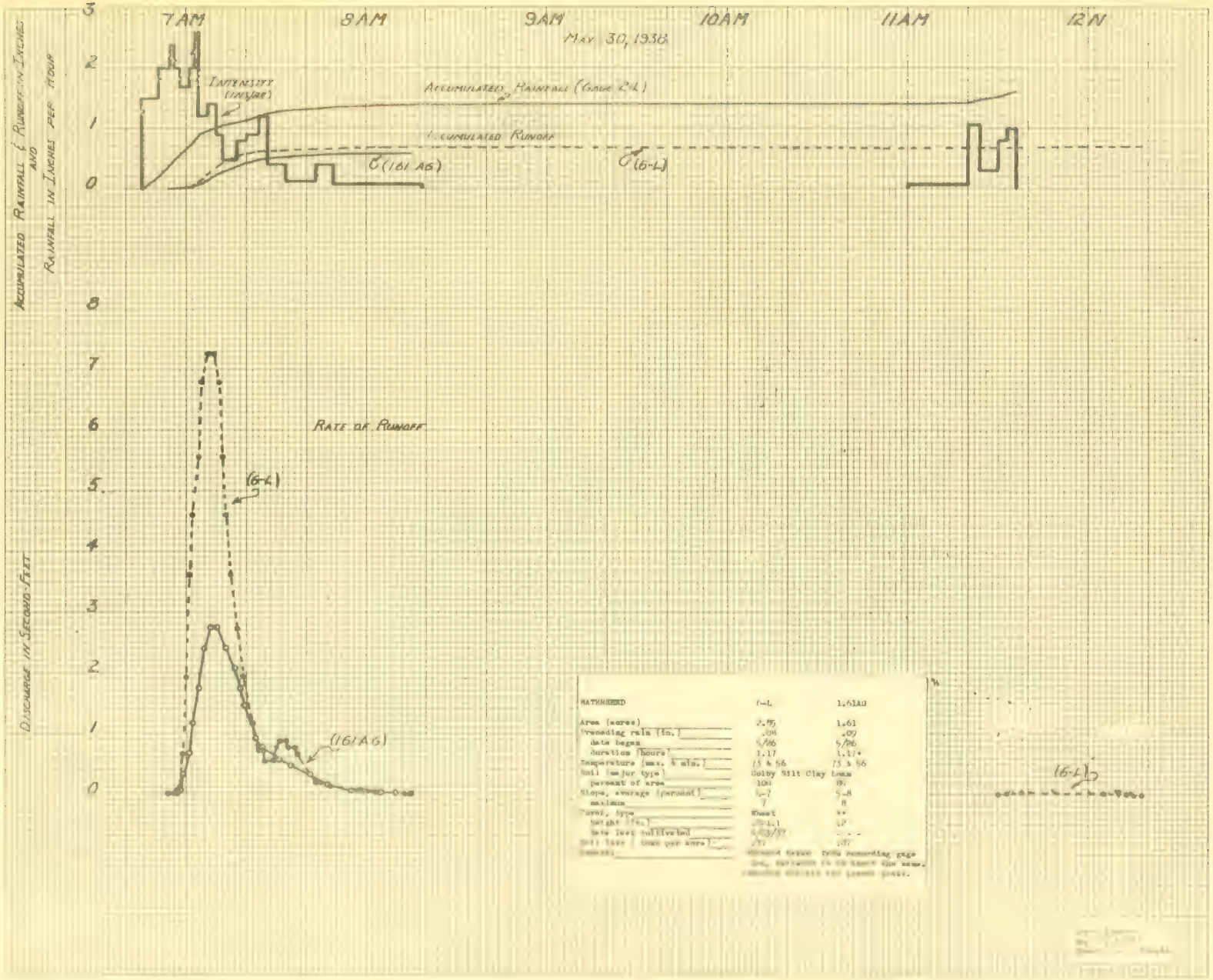




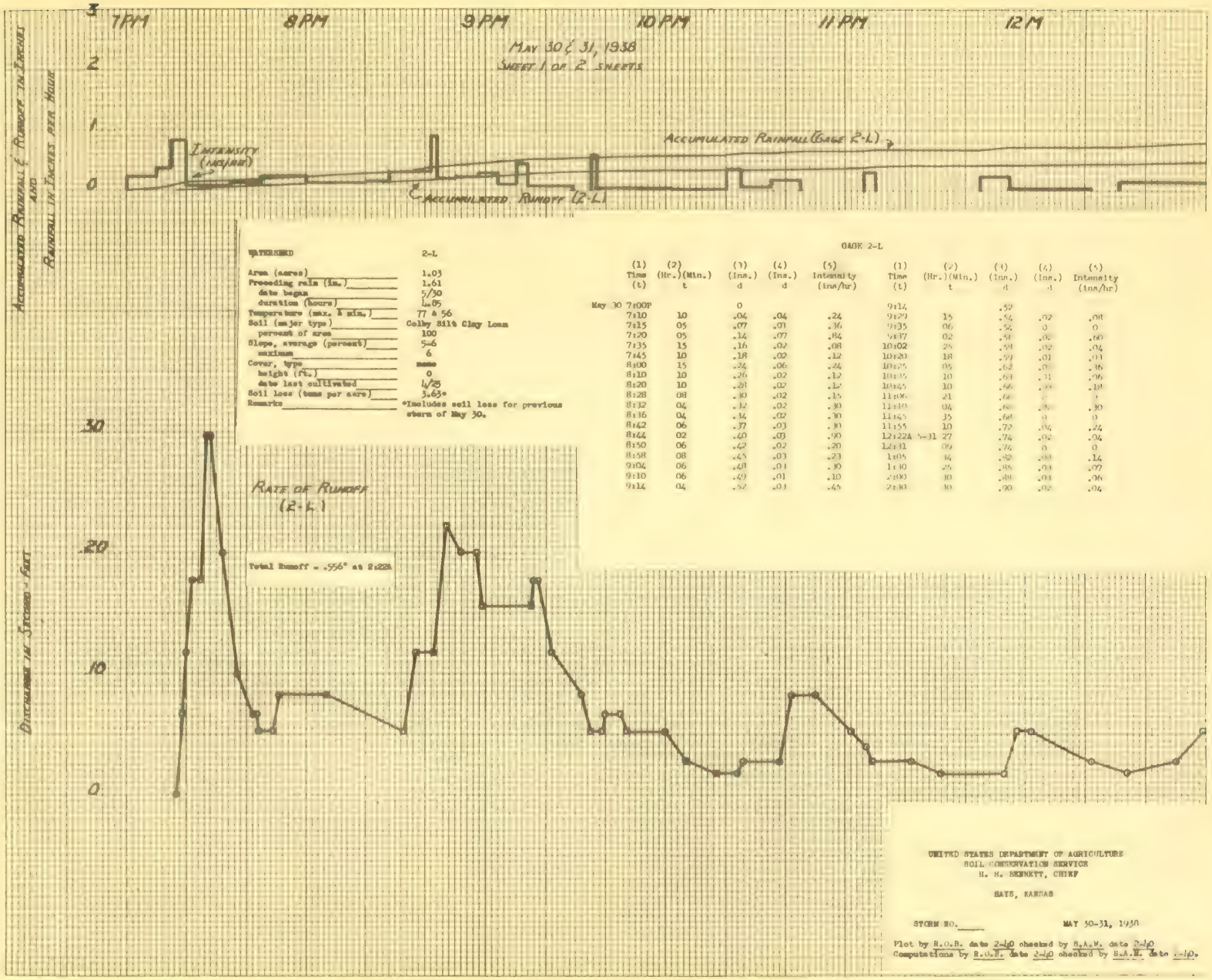


WATERSHED	2-W	3-W
Area (acres)	2.8	2.9
Preceding rain (in.)	.16	.16
date began	5/26	5/26
duration (hours)	1.17*	1.17*
Temperature (max. & min.)	73 & 56	73 & 56
Soil (major type)	Colby Silt Clay Loam	
percent of area	90	90
Slope, average (percent)	3-7	3-7
maximum	7	7
Cover, type	Wheat	Wheat
height (ft.)	.8-1.1	.8-1.1
date last cultivated	9/11/57	9/11/57
Soil loss (tons per acre)	<1	<1

Remarks: *Record taken from recording gage 2-L, believed to be about the same.



WATERSHED	6-L	1.61AB
Area (acres)	2.55	1.61
Preceding rain (in.)	.08	.09
date began	5/26	5/26
duration (hours)	1.17	1.17
Temperature (max. & min.)	73 & 56	73 & 56
Soil (major type)	Colby Silt Clay loam	
(percent of area)	100	95
Slope, average (percent)	4-7	5-8
maximum	7	8
Cover, type	Wheat	**
height (ft.)	.75-1.1	1.2
date last cultivated	5/3/37	- - -
Soil loss (tons per acre)	.11	.07
Remarks:	Measured values from recording gage	



WATERSHED	2-L
Area (acres)	1.03
Preceding rain (in.)	1.61
date began	5/30
duration (hours)	1.85
Temperature (max. & min.)	77 & 56
Soil (major type)	Colby Silt Clay Loam
percent of area	100
Slope, average (percent)	5-6
maximum	6
Cover, type	None
height (ft.)	0
date last cultivated	4/28
Soil loss (tons per acre)	3.63*
Remarks	*Includes soil loss for previous storm of May 30.

GAGE 2-L

(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Ins.) d	(4) (Ins.) d	(5) Intensity (ins/hr)	(1) Time (t)	(2) (Hr.)(Min.) t	(3) (Inn.) d	(4) (Ins.) d	(5) Intensity (ins/hr)
May 30 7:00P		0			9:14		.52		
7:10	10	.04	.04	.24	9:29	15	.54	.02	.08
7:15	05	.07	.03	.36	9:35	06	.54	0	0
7:20	05	.14	.07	.84	9:37	02	.56	.02	.60
7:35	15	.16	.02	.08	10:02	25	.58	.02	.04
7:45	10	.18	.02	.12	10:20	18	.59	.01	.03
8:00	15	.24	.06	.24	10:25	05	.62	.03	.36
8:10	10	.26	.02	.12	10:40	10	.63	.01	.06
8:20	10	.28	.02	.12	10:45	10	.66	.03	.18
8:28	08	.30	.02	.15	11:06	21	.66	0	0
8:32	04	.32	.02	.30	11:10	04	.68	.02	.30
8:36	04	.34	.02	.30	11:45	35	.68	0	0
8:42	06	.37	.03	.30	11:55	10	.72	.04	.24
8:44	02	.40	.03	.90	12:22A 5-31	27	.74	.02	.04
8:50	06	.42	.02	.20	12:31	09	.74	0	0
8:58	08	.45	.03	.23	1:05	34	.82	.08	.14
9:04	06	.48	.03	.30	1:40	35	.85	.03	.07
9:10	06	.49	.01	.10	2:00	20	.88	.03	.06
9:14	04	.52	.03	.45	2:30	30	.90	.02	.04

Rate of Runoff (2-L)

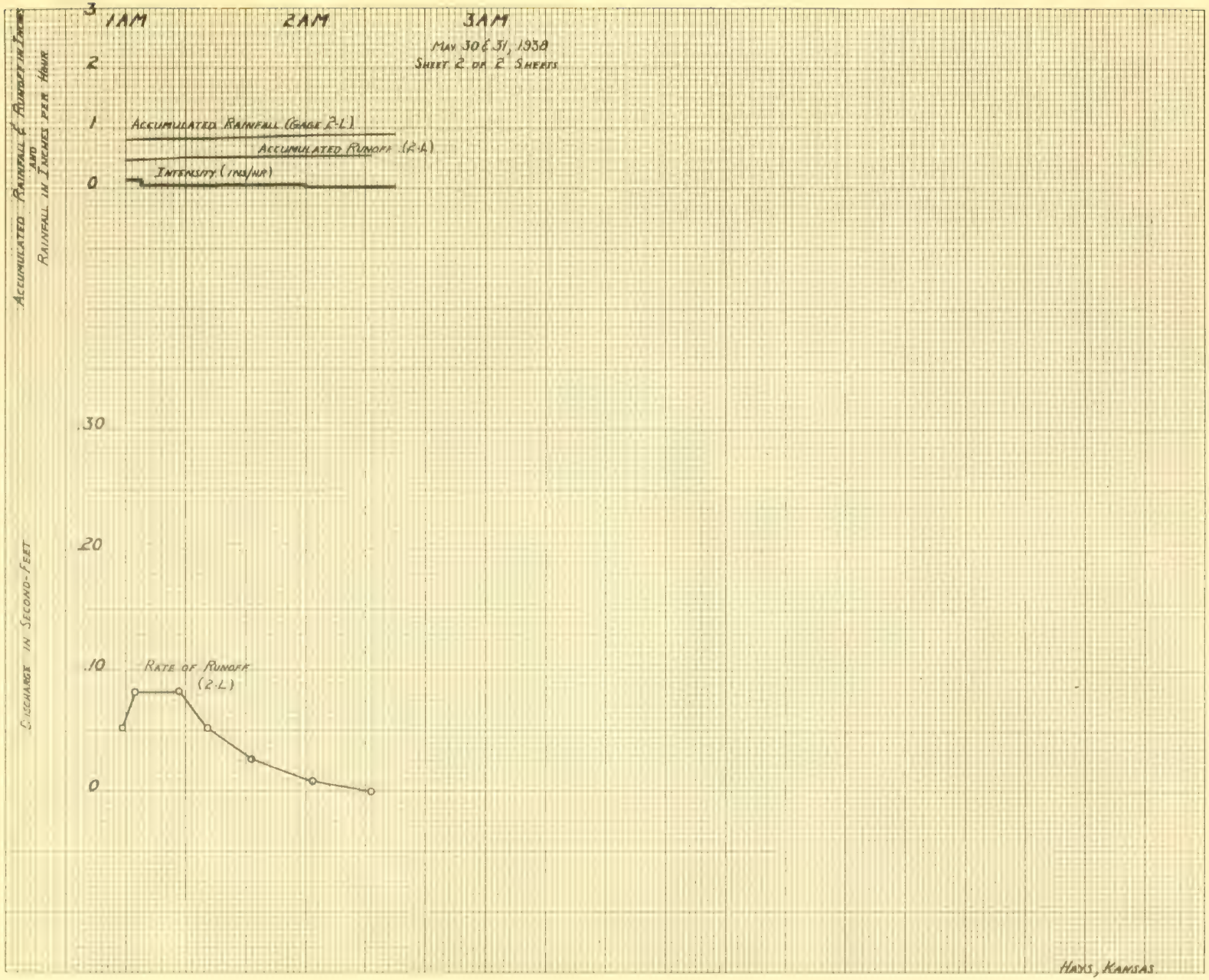
Total Runoff = .556" at 2:22A

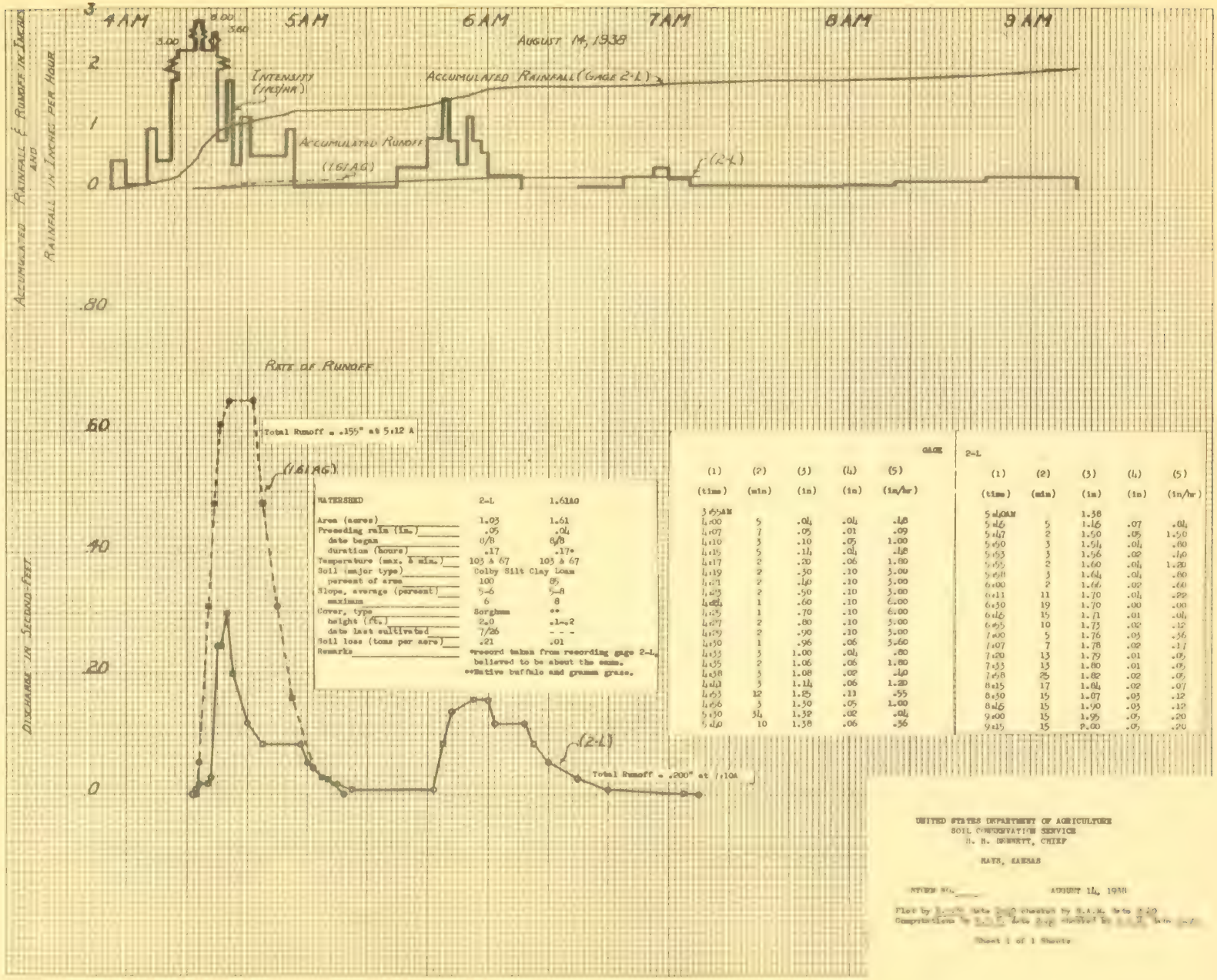
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO.____ MAY 30-31, 1938

Plot by R.O.B. date 2-40 checked by R.A.M. date 2-40
Computations by R.O.B. date 2-40 checked by R.A.M. date 2-40.


ACCUMULATED RAINFALL & RUNOFF IN INCHES AND RAINFALL IN INCHES PER HOUR
DISCHARGE IN SECOND-FEET
3
2
1
0
1AM
2AM
3AM
MAY 30 & 31, 1938
SHEET 2 OF 2 SHEETS
ACCUMULATED RAINFALL (GAGE 2-L)
ACCUMULATED RUNOFF (2-A)
INTENSITY (INS/HR)
30
20
10
0
RATE OF RUNOFF
(2-L)
HAYS, KANSAS



WATERSHED	2-L	1.61AC
Area (acres)	1.03	1.61
Preceding rain (in.)	.05	.04
date began	8/8	8/8
duration (hours)	.17	.17*
Temperature (max. & min.)	103 & 67	103 & 67
Soil (major type)	Colby Silt Clay Loam	
percent of area	100	85
Slope, average (percent)	5-6	5-8
maximum	6	8
Cover, type	Sorghum	**
height (ft.)	2.0	1.5-2
date last cultivated	7/26	- - -
Soil loss (tons per acre)	.21	.01
Remarks	*record taken from recording gage 2-L, believed to be about the same. **native buffalo and grama grass.	

GAGE

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
3:55AM				
4:00	5	.04	.04	.48
4:07	7	.05	.01	.09
4:10	3	.10	.05	1.00
4:15	5	.14	.04	.48
4:17	2	.20	.06	1.80
4:19	2	.30	.10	5.00
4:21	2	.40	.10	5.00
4:23	2	.50	.10	5.00
4:24	1	.60	.10	6.00
4:25	1	.70	.10	6.00
4:27	2	.80	.10	5.00
4:29	2	.90	.10	5.00
4:30	1	.96	.06	3.60
4:33	3	1.00	.04	.80
4:35	2	1.06	.06	1.80
4:38	3	1.08	.02	.40
4:43	5	1.14	.06	1.20
4:53	12	1.25	.11	.55
4:56	3	1.30	.05	1.00
5:30	34	1.32	.02	.04
5:40	10	1.38	.06	.36

2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
5:40AM		1.38		
5:46	5	1.46	.07	.84
5:47	2	1.50	.05	1.50
5:50	3	1.54	.04	.80
5:53	3	1.56	.02	.40
5:55	2	1.60	.04	1.20
5:58	3	1.64	.04	.80
6:00	2	1.66	.02	.60
6:11	11	1.70	.04	.22
6:30	19	1.70	.00	.00
6:46	16	1.71	.01	.04
6:55	10	1.73	.02	.12
7:00	5	1.76	.03	.36
7:07	7	1.78	.02	.17
7:20	13	1.79	.01	.05
7:33	13	1.80	.01	.05
7:38	25	1.82	.02	.05
8:15	17	1.84	.02	.07
8:30	15	1.87	.03	.12
8:46	15	1.90	.03	.12
9:00	15	1.95	.05	.20
9:15	15	2.00	.05	.20

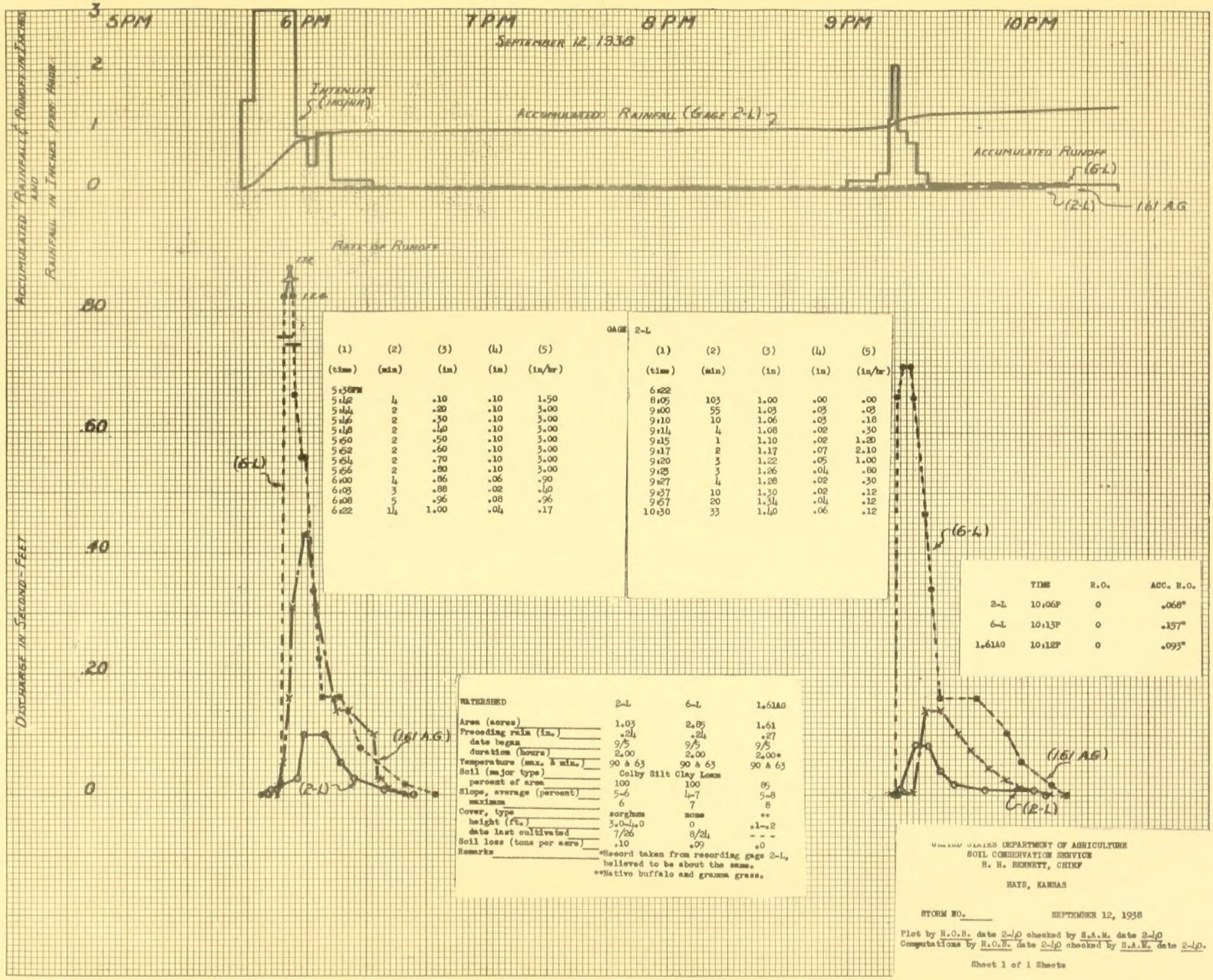
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

NOTES NO. ____ AUGUST 14, 1938

Plot by [illegible] Date [illegible] Checked by R.A.M. Date [illegible]
Computations by [illegible] Date [illegible] Checked by [illegible] Date [illegible]

Sheet 1 of 1 Sheets



GAGE 6-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
5:38PM				
5:42	4	.10	.10	1.50
5:44	2	.20	.10	3.00
5:46	2	.30	.10	3.00
5:48	2	.40	.10	3.00
5:50	2	.50	.10	3.00
5:52	2	.60	.10	3.00
5:54	2	.70	.10	3.00
5:56	2	.80	.10	3.00
6:00	4	.86	.06	.90
6:03	3	.88	.02	.40
6:08	5	.96	.08	.96
6:22	14	1.00	.04	.17

GAGE 2-L

(1) (time)	(2) (min)	(3) (in)	(4) (in)	(5) (in/hr)
6:22				
8:05	103	1.00	.00	.00
9:00	55	1.03	.03	.03
9:10	10	1.06	.03	.18
9:14	4	1.08	.02	.30
9:15	1	1.10	.02	1.20
9:17	2	1.17	.07	2.10
9:20	3	1.22	.05	1.00
9:23	3	1.26	.04	.80
9:27	4	1.28	.02	.30
9:37	10	1.30	.02	.12
9:57	20	1.34	.04	.12
10:30	33	1.40	.06	.12

	TIME	R.O.	ACC. R.O.
2-L	10:06P	0	.066"
6-L	10:13P	0	.157"
1.61AG	10:12P	0	.093"

WATERSHED	2-L	6-L	1.61AG
Area (acres)	1.03	2.85	1.61
Preceding rain (in.)	.24	.24	.27
date began	9/5	9/5	9/5
duration (hours)	2.00	2.00	2.00*
Temperature (max. & min.)	90 & 63	90 & 63	90 & 63
Soil (major type)	Colby Silt Clay Loam		
percent of area	100	100	85
Slope, average (percent)	5-6	4-7	5-8
maximum	6	7	8
Cover, type	sorghum	none	**
height (ft.)	3.0-4.0	0	.1-.2
date last cultivated	7/26	8/24	- - -
Soil loss (tons per acre)	.10	.09	.0

Remarks

*Record taken from recording gage 2-L, believed to be about the same.
**Native buffalo and gramma grass.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

HAYS, KANSAS

STORM NO. _____ SEPTEMBER 12, 1938

Plot by R.O.S. date 2-10 checked by S.A.M. date 2-10
Computations by R.O.S. date 2-10 checked by S.A.M. date 2-10.

Sheet 1 of 1 Sheets